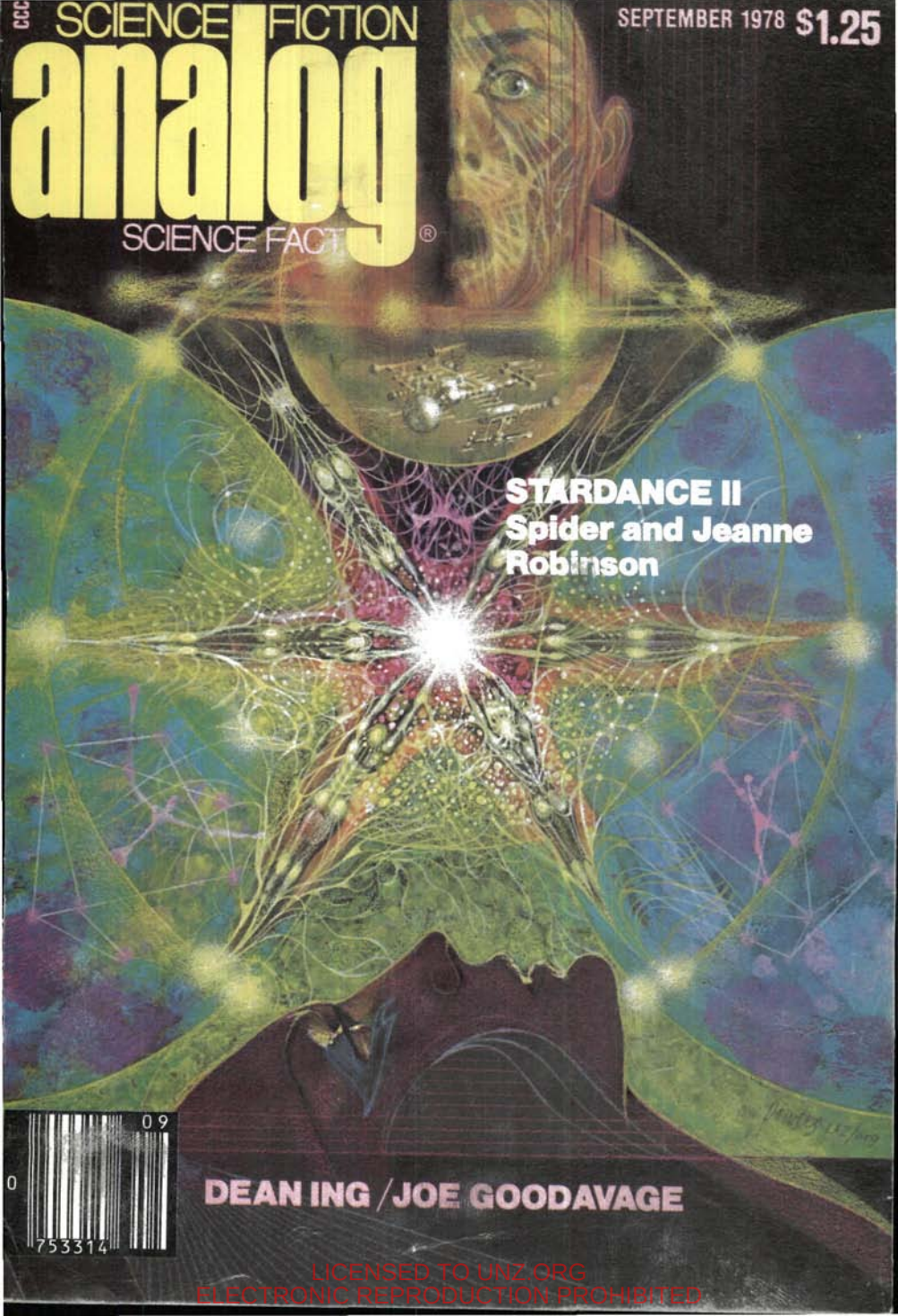

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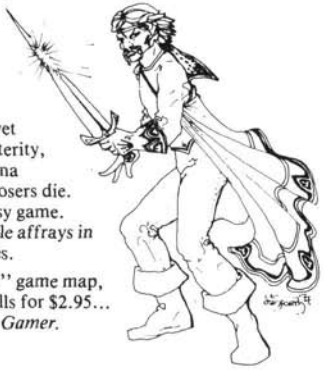
MELEE



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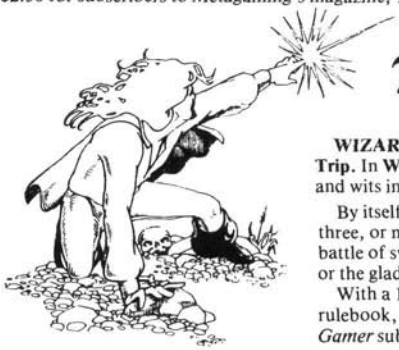
MELEE is the most detailed simulation of single combat yet developed. Players create fighters, set their strength and dexterity, choose their weapons and armor, and send them into the arena against human or monstrous opponents. Victors gain skill; losers die.

MELEE can be used as a tactical supplement to any fantasy game. It will also interest any student of history. Play out small-scale affrays in ancient Rome, feudal Europe, or whenever your heart desires.

Game components include a 20-page rulebook, an 8" x 14" game map, and a sheet of giant (¾" and up) game counters. **MELEE** sells for $2.95... $2.50 for subscribers to Metagaming's magazine, *The Space Gamer.*



WIZARD

WIZARD...the *magical* combat system from **The Fantasy Trip.** In **WIZARD**, you become a sorceror...using your spells and wits in a duel to the death.

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DEATH TEST is a "programmed adventure" for **The Fantasy Trip.** Using the **MELEE** rules (and, optionally, **WIZARD** as well), a single player — or up to four, with or without a referee — face a fiendish maze of dangers. The **DEATH TEST** rulebook presents them with decisions and combat situations . . . only the clever survive. **NOTE:** You *must* have **MELEE** to play this game. Components include the 24-page game book and a new counter set. **DEATH TEST** sells for $2.95...$2.50 to *The Space Gamer* subscribers.

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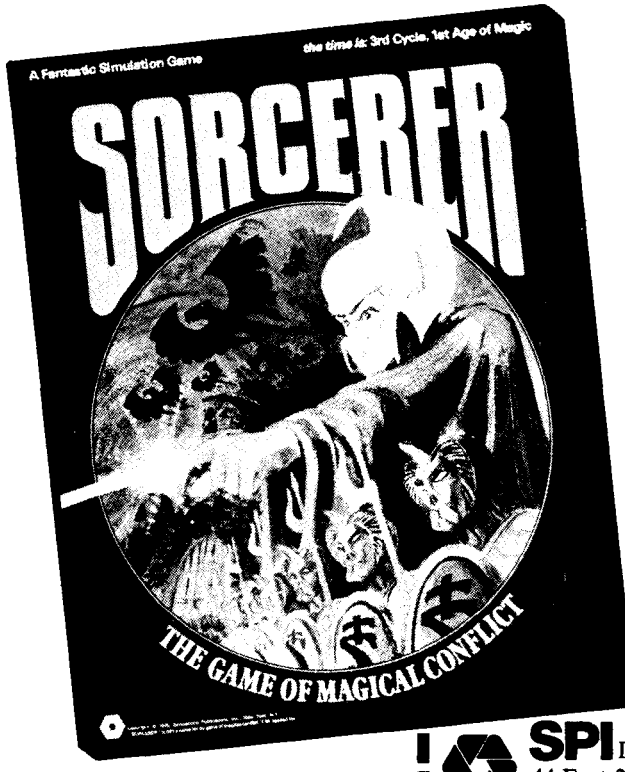

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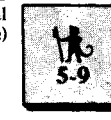

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Associate Editor
ED PELLEGRINI
Editorial Assistant
HERBERT S. STOLTZ
Art Director
GERALDINE PRASIOTIS
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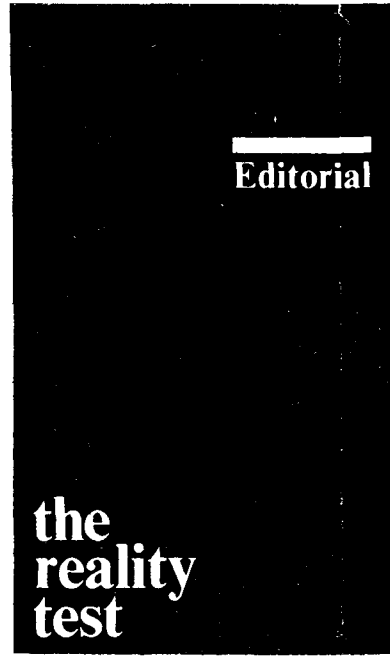

the reality test

Is science fiction really a "useful" form of literature, or is it merely a form of escapism?

We all like to think that science fiction helps us to understand the world around us, and to prepare us for possible futures. Sometimes science fiction even *predicts* what's going to happen in the future.

Although we would never demand that science fiction be restricted only to "socially significant" stories that deal only with present-day problems, we do recognize that science fiction should have something to say about the real world.

Now, when a scientist produces a new idea, it is quickly checked out by other scientists. That's the way science works, and the major reason why science is such a powerful tool for human understanding. Science makes predictions that can be tested. Predictions that can be verified with hard, numerical data become a part of humankind's store of knowledge. Predictions that flop are discarded.

This is one reason why nonscientists are awed and often fearful of science and scientists. Science works! Other forms of prediction—from astrology to psychic phenomena—have all the reliability of a broken clock.

Well, what about science fiction? How does our favorite field stack up in the Reality Test?

Recognize that science fiction writers make no pretense of trying to predict the future. That's not what they're after. Science fiction stories show possible futures, potential tomorrows, that are based on a set of assumptions the writer makes before setting the first word to paper. "If this goes on . . ." is a classic thought-pattern for triggering new science fiction stories. So is, "What if . . . ?"

But let's apply the Reality Test to some of the things you've read here in the pages of Analog. Are we dealing with the real world, or are we (as some critics still insist) merely playing escapist games in our heads?

Everyone's heard the classic tale of Cleve Cartmill's story, "Deadline," published in *Astounding* back in 1944. Months before the first nuclear bomb was tested at Alamagordo, Cartmill explained the basic principles behind making a uranium bomb—much to the distress of the FBI.

Even more significant was an earlier story by Robert A. Heinlein, "Solution Unsatisfactory," which predicted

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the international political balance of terror that would follow the development of nuclear weaponry. Heinlein predicted the Cold War in a single concise paragraph, ten years before the event.

You are probably aware that the first known mention in print of the idea of propelling spacecraft by using solar sails appeared in the May 1951 issue of *Astounding*. Carl A. Wiley, writing under the pseudonym of Russell Saunders, proposed using light pressure to push ships through interplanetary space in a nonfiction piece titled "Clipper Ships of Space."

As NASA scientist Chauncey Uphoff reported in our June 1977 Brass Tacks section, the Jet Propulsion Laboratory of CalTech did a literature search on solar sailing, and established Wiley's article as the first one on the subject. NASA is now investigating a program to develop solar sail technology for future deep space missions.

In the September 1976 issue, the Editorial titled "Not Supersonic Enough" pointed out the economic drawbacks of the Anglo-French Concorde SST, and predicted that an economically viable SST would have to be capable of speeds in excess of Mach 3, would have to carry at least 200 passengers, and would most likely run on hydrogen-fueled engines.

The Concorde is now landing daily at New York City's Kennedy Airport, but its economic prospects are still deeply shrouded in gloom. All the Concordes that will ever be built have now been constructed. Airlines are not asking for any more.

But (surprise!) good old NASA granted a $270,000 contract to Lockheed late in 1977 to study a Mach 6, 200-passenger, hydrogen-burning hypersonic airliner. The plane would be powered by a combination of turbojets and scramjets (supersonic combustion ram jets). It would make the Los Angeles to Tokyo flight in less than two and a half hours; New York to London in under two hours.

Lockheed's manager for hydrogen-fueled engine studies was quoted as saying that a large part of the problem of sonic booms may be solved by flying higher than today's supersonic planes. The proposed hypersonic airliner would cruise at altitudes of 110,000 to 120,000 feet.

A study contract is the first step in a decades-long engineering development program. Possibly such a hypersonic airliner will never be built. But, if the logic of the September 1976 Editorial prevails, the airlines will want *and need* a plane that can make the vast Pacific Ocean as small a "pond" as subsonic jets have made of the Atlantic.

Remember the "Crazy Ideas" Editorial, from the February 1974 issue? One of the crazy ideas espoused was to extend the Twenty-Second Amendment to every political officeholder in the nation, and not allow anyone to stay in office more than two consecutive terms.

Many readers objected strenuously

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Year	President	Congress	Annual Change in Inflation Rate	Annual Change in Unemployment Rate	Annual Change in Industrial Production	Annual Change in Personal Disposable Income
1940	Democratic	Democratic	+1.0%	−2.6%	+14.9%	+ $38
1941	Democratic	Democratic	+5.0%	−4.7%	+28.4%	+$119
1942	Democratic	Democratic	+10.7%	−5.2%	+22.7%	+$169
1943	Democratic	Democratic	+6.1%	−2.8%	+19.6%	+$109
1944	Democratic	Democratic	+1.7%	−0.7%	−1.3%	- $78
1945	Democratic	Democratic	+2.3%	+0.7%	−13.7%	+ $14
1946	Democratic	Democratic	+8.5%	+2.0%	−15.7%	+ $54
1947	Democratic	*Republican*	+14.4%	0.0%	+10.6%	+ $53
1948	Democratic	*Republican*	+7.8%	−0.1%	+4.1%	+$116
1949	Democratic	Democratic	−1.0%	+2.1%	−5.5%	− $20
1950	Democratic	Democratic	+1.0%	−0.6%	+15.9%	+ $80
1951	Democratic	Democratic	+7.9%	−2.0%	+8.4%	+$128
1952	Democratic	Democratic	+2.2%	−0.2%	+3.7%	+ $49
1953	*Republican*	*Republican*	+0.8%	−0.2%	+8.3%	- $62
1954	*Republican*	*Republican*	+0.5%	+2.7%	−5.9%	+ $1
1955	*Republican*	Democratic	−0.4%	−1.2%	+12.5%	+ $81
1956	*Republican*	Democratic	+1.5%	−0.2%	-3.4%	+ $78
1957	*Republican*	Democratic	+3.6%	+0.1%	+0.8%	+ $61
1958	*Republican*	Democratic	+2.7%	+2.5%	−6.9%	+ $29
1959	*Republican*	Democratic	+0.8%	−1.3%	+12.6%	+ $75
1960	*Republican*	Democratic	+1.6%	+0.1%	+3.0%	+ $41
1961	Democratic	Democratic	+1.0%	+1.1%	+0.9%	+ $54
1962	Democratic	Democratic	+1.1%	−1.1%	+7.8%	+ $87
1963	Democratic	Democratic	+1.2%	+0.1%	+5.1%	+ $76
1964	Democratic	Democratic	+1.3%	−0.5%	+6.5%	+$151
1965	Democratic	Democratic	+1.7%	−0.7%	+8.4%	+$155
1966	Democratic	Democratic	+2.9%	−0.7%	+9.0%	+$169
1967	Democratic	Democratic	+2.9%	0.0%	+1.1%	+$143
1968	Democratic	Democratic	+4.2%	−0.2%	+4.7%	+$193
1969	*Republican*	Democratic	+5.4%	−0.1%	+4.4%	+$165
1970	*Republican*	Democratic	+5.9%	+1.4%	−2.5%	+$259
1971	*Republican*	Democratic	+7.8%	+1.0%	+0.2%	+$438
1972	*Republican*	Democratic		−0.3%	+7.9%	
1973	*Republican*	Democratic	+6.2%	−0.7%	+9.0%	+$427
1974	*Republican*	Democratic	+12.8%	+0.4%	----	+$235
AVERAGES FOR ALL YEARS						
	Democratic	Democratic	+3.3%	−0.8%	+6.4%	+ $97
	Democratic	*Republican*	+11.1%	−0.1%	+7.4%	+ $85
	Republican	Democratic	+4.0%	+0.1%	+4.0%	+$157
	Republican	*Republican*	+0.6%	+1.3%	+1.2%	+ $32
	Democratic	----------	+4.0%	−0.8%	+6.5%	+ $96
	----------	Democratic	+3.5%	−0.5%	+5.5%	+$120
	Republican	----------	+3.6%	+0.3%	+3.6%	+$139
	----------	*Republican*	+5.9%	+0.6%	+4.3%	+ $58

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to the idea and pointed out—with a good deal of logic—that such a system would merely give government bureaucracies even more power than they have now. Politicians would be shuttling in and out of office, but their staffs and the departmental bureaucracies would remain entrenched.

Perhaps so, but on December 11, 1977, newspapers around the country reported that a Gallup Poll showed that sixty percent of American voters favored limiting U.S. senators and representatives to a maximum of twelve years in office. That is two senatorial terms, six terms for a congressperson. The idea of establishing limits on the number of times a politician can get reelected is catching on.

The September 1977 Editorial, "Problem Grokking," posed the possibility of using computerized simulations, such as MIT produced for the Club of Rome's "Limits to Growth" study, to check up on the performance of political parties.

Reader Robert A. Freitas Jr. did just that, and produced a cost/benefit analysis of the Republican and Democratic parties for the years 1940-1974 (see p. 7). (Freitas, a member of the American Association for the Advancement of Science and a British Interplanetary Society Associate Fellow, is a law student and the author of "Lobbying for Space.")

Now you can survey the historical record to see which party has been more effective in curbing unemployment, lowering inflation, and increasing industrial production and disposable income.

Ever since the June 1974 Editorial on "Teaching Science Fiction," Analog has been embroiled in a running battle about what's wrong with our schools, who's to blame, and how to change things for the better. Our position has been that the core of the problem is *standards*. Students are being graduated without being required to learn anything. The term "functional illiterate" has entered our everyday vocabulary. It means a person who has a diploma in his or her hand, but is unable to read what the diploma says.

The problem is very complex, and the teachers have been quick to disclaim responsibility for what their students learn—or fail to learn.

But across the nation a groundswell of opinion is forcing schools to reexamine the way they work. New voices are insisting on competency tests, not only for the students, but for the teachers as well. In New York City, several thousand public school teachers failed standard high school-level reading exams early in 1978!

In the April 2, 1978 issue of the *New York Times*, a small article pointed out that while most schools showed declining scores in their students' Scholastic Aptitude Tests (SATs), the scores at 100 of the nation's 20,000 high schools have remained steady—or even risen. Why?

To quote from the Times article, "In general . . . the schools stressed

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tough courses in English, mathematics, foreign languages, and science; discouraged easy electives . . . often grouped students by ability, and sometimes set standards higher than the law required.

"The successful schools were found in all sections of the country and in both affluent and lower-middle-class communities. . . . 'The constant among the successful S.A.T. score schools is intent, not technique,' the report said . . ."

Standards, in other words. Just what we've been stressing here in this escapist magazine.

In our November 1977 issue Joe Patrouch's story, "Legal Rights for Germs," spoofed various civil rights and right-to-life movements that shrilly insist on "granting freedom" to groups that are getting smaller and more obscure every day. The story called for an end to our "unwarranted murder" of billions of living creatures—bacteria and viruses—through the use of baths, medicines, and various cleaning methods.

The *National Enquirer* (yes, even *they* read Analog) picked up on Patrouch's idea and sent out reporters armed with petitions asking people to sign up in support of a wholly fictitious Society for the Preservation of Germs and Insects. The petition read, in part:

"Every creature, however small, has a right to live its own life. By bathing and taking medicines, we are killing billions and billions of living creatures every day. . . . How can we have the arrogance to kill so many living things just so our bodies, our breath and bathrooms will smell clean?"

The reporters collected 100 signatures from the first 138 people they approached. P. T. Barnum is alive and well, folks.

Sometimes you have to run pretty hard to stay ahead, though.

Bill Johns' novelette in our May 1978 issue, "Renewal," dealt with a scientist's re-creation of a wooly mammoth from DNA obtained from cells of a mammoth found frozen in Siberia.

Dr. T. C. Hsu, of the University of Texas' M. D. Anderson Hospital and Tumor Institute is doing something disturbingly close to that—he is collecting thousands of cell samples of animals now threatened with extinction, and preserving them by freezing them in liquid nitrogen.

"Stored in liquid nitrogen," Dr. Hsu says, "the animal's cells can be preserved for a thousand years if that is how long it takes for man to learn to manipulate a cell so that it will differentiate into a complete animal.

"It sounds like science fiction now," he goes on, "but not too long ago science fiction was a rocket landing on the Moon."

It seems quite clear that science fiction passes the Reality Test. As Isaac Asimov once said when told that science fiction is "escape literature":

"Escapism? Sure. Science fiction is escape—*into reality!*" **THE EDITOR**

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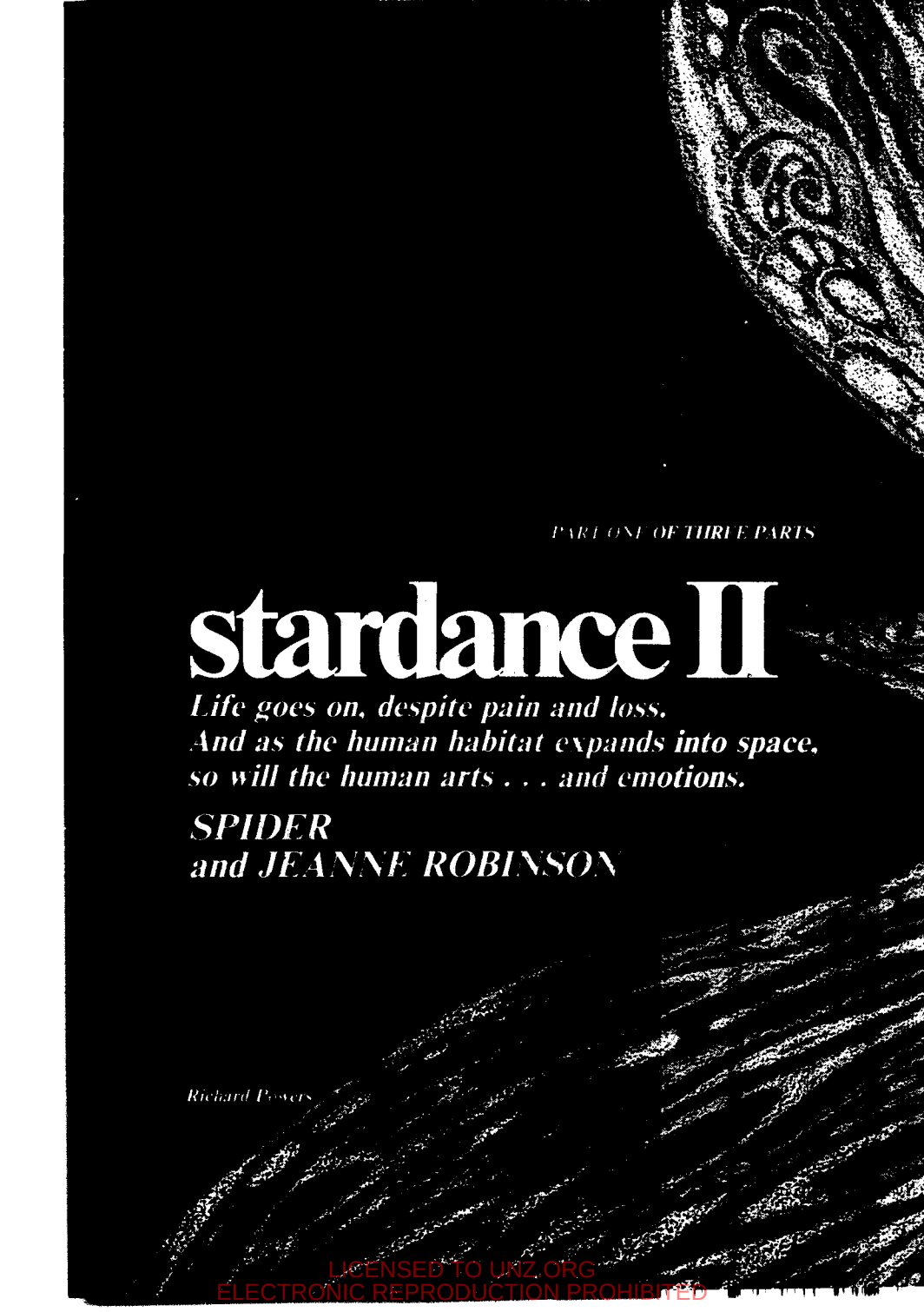

PART ONE OF THREE PARTS

stardance II

Life goes on, despite pain and loss.
And as the human habitat expands into space,
so will the human arts . . . and emotions.

SPIDER
and JEANNE ROBINSON

Richard Powers

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CHAPTER ONE

The flight from Washington was miserable. How can a man who's worked in free fall get airsick? Worse, I had awakened that morning with the same stinking cold I had had ever since returning Earthside, and so I spent the whole flight anticipating the knives that would be thrust through my ears when we landed. But I turned down the proffered drink as well as the meal.

I was not even depressed. Too much had happened to me in the last few weeks. I was wrung out, drained, just sort of . . . on standby, taking disinterested notes while my automatic pilot steered my body around. It helped to be in a familiar place—why, come to think, hadn't I once thought of Toronto, about a thousand years ago, as "home"?

There were reporters when I got through Customs, of course, but not nearly as many as there had been at first. Once, as a kid, I spent a summer working in a mental hospital, and I learned an extraordinary thing: I learned that anyone, no matter how determined, whom you *utterly* ignore will eventually stop pestering you and go away. I had been practicing the technique so consistently for the last three weeks that the word had gone out, and now only the most Skinnerian newspapers even troubled to stick microphones in my face. Eventually there was a cab in front of me and I took it. Toronto cabbies can be relied upon not to recognize anybody, thank God.

I was "free" now.

Reentering the TDT studio was a strong déjà vu experience, strong enough almost to penetrate my armor. Once, geologic ages ago, I had worked here for three years, and briefly again thereafter. And once, in this building, I had seen Shara Drummond dance for the first time. I had come full circle.

I felt nothing.

Always excepting, of course, the goddamned leg. After all the time in free fall, it hurt much worse than I'd remembered, more than it had hurt since the original days of its ruining, unimaginably far in the past. I had to pause twice on the way upstairs, and I was soaking with sweat by the time I made the top. (Ever wonder why dance studios are *always* up at least one flight of stairs? Did you ever try to rent that much square footage at ground level?) I waited on the landing, regularizing my breathing, until I decided that my color had returned, and then a few seconds more. I knew I should feel agitated now, but I was still on standby.

I opened the door, and déjà vu smacked at me again. Norrey was across the old familiar room, and just as before she was putting a group of students through their paces. They might have been the same students. Only Shara was missing. Shara would always be missing. Shara was air pollution now, upper atmosphere pollution, much more widely distributed than most corpses get to be.

She had been cremated at the *top* of

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the atmosphere, and by it.

But her older sister was very much alive. She was in the midst of demonstrating a series of suspensions on half-toe as I entered, and I just had time to absorb an impression of glowing skin, healthy sweat, and superb muscle tone before she glanced up and saw me. She stiffened like a stop-frame shot, then literally fell out of an extension. Automatically her body tucked and rolled, and she came out of it at a dead run, crying and swearing as she came, arms outstretched. I barely had time to brace the good leg before she cannoned into me, and then we were rocking in each other's arms like tipsy giants, and she was swearing like a sailor and crying my name. We hugged for an endless time before I became aware that I was holding her clear of the floor and that my shoulders were shrieking nearly as loud as my leg. *Six months ago it would have buckled,* I thought vaguely, and set her down.

"All right, are you all right, are you all right?" her voice was saying in my ear.

I pulled back and tried to grin. "My leg is killing me. And I think I've got the flu."

"Damn you, Charlie, don't you dare misunderstand me. *Are you all right?*" Her fingers gripped my neck as if she intended to chin herself.

My hands dropped to her waist and I looked her in the eyes, abandoning the grin. All at once I realized I was no longer on standby. My cocoon was smithereened, blood sang in my ears and I could feel the very air impinging on my skin. For the first time I thought about why I had come here, and partly I understood. "Norrey," I said simply, "I'm okay. Some ways I think I'm in better shape than I've been in twenty years."

The second sentence just slipped out, but I knew as I said it that it was true. Norrey read the truth in my eyes, and somehow managed to relax all over without loosing her embrace. "Oh, thank *God*," she sobbed, and pulled me closer. After a time her sobs lessened, and she said, almost petulantly, her voice tiny, "I'd have broken your *neck*," and we were both grinning like idiots and laughing aloud. We laughed ourselves right out of our embrace, and then Norrey said, "Oh!" suddenly and turned bright red and spun round to her class.

It seemed that we were occupying the only portion of the room that was not intensely fascinating. They knew. They watched TV, they read the papers. Even as we watched, one of the students stepped out in front of the rest. "All right," she said to them, "let's take it from the top, I'll give you three for nothing and—*one*," and the whole group resumed their workout. The new leader would not meet Norrey's eyes, refused to accept or even acknowledge the gratitude there—but she seemed to be smiling gently, as she danced, at nothing in particular.

Norrey turned back to me. "I'll have to change."

"Not much, I hope."

She grinned again and was gone.

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My cheeks itched, and when I absently scratched them I discovered that they were soaking wet.

The afternoon outdoors struck us both with wonder. New colors seemed to boil up out of the spectrum and splash themselves everywhere in celebration of fall. It was one of those October days of which, in Toronto anyway, one can say either "Gee it's chilly" or "Gee it's warm" and be agreed with. We walked through it together arm in arm, speaking only occasionally and then only with our eyes. My stuffed head began to clear; my leg throbbed less.

Le Maintenant was still there then, but it looked shabbier than ever. Fat Humphrey caught sight of us through the kitchen window as we entered and came out to greet us. He is both the fattest happy man and the happiest fat man I've ever seen. I've seen him outdoors in February in his shirt sleeves, and they say that once a would-be burglar stabbed him three times without effect. He burst through the swinging doors and rushed toward us, a mountain with a smile on top. "Mist' Armstead, Miz Drummond! Welcome!"

"Hey there, Fat," I called out, removing my filters, "God bless your face. Got a good table?"

"Sure thing, in the cellar somewheres, I'll bring it up."

"I'm sorry *I* brought it up."

"There's certainly *some*thing wrong with your upbringing," Norrey agreed dryly.

Fat Humphrey laughing aloud is like an earthquake in the Canadian Rockies. "Good to see you, good to see you both. You been away too long, Mist' Armstead."

"Tell you about it later, Fat, okay?"

"Sure thing. Lemme see: you look like about a pound of sirloin, some bake' potato, peas Italian, hold the garlic, and a bucket of milk. Miz Drummond, I figure you for tuna salad on whole wheat toast, side of slice' tomatoes and a glass of milk. Salad all around. Eh?"

We both burst out laughing. "Right again, as usual. Why do you bother to print menus?"

"Would you believe it? There's a law. How would you like that steak cooked?"

"Gee, that'd be terrific," I agreed, and took Norrey's coat and filtermask. Fat Humphrey howled and slapped his mighty thigh, and took my own gear while I was hanging Norrey's. "Been missin' you in this joint, Mist' Armstead. None of these other turkeys know a straight line when they hear it. This way." He led us to a small table in the back, and as I sat down I realized that it was the same table Norrey and Shara and I had shared so long ago. That didn't hurt a bit: it felt right. Fat Humphrey rolled us a joint by hand from his personal stash, and left the bag and a packet of Drums on the table. "Smoke hearty," he said and returned to the kitchen, his retreating buttocks like wrestling zeppelins.

I had not smoked in weeks; at the

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first taste I started to buzz. Norrey's fingers brushed mine as we passed the digit, and their touch was warm and electric. My nose, which had started to fill as we came indoors, flooded, and between toking and honking the joint was gone before a word had been spoken. I was acutely aware of how silly I must look, but too exhilarated to fret about it. I tried to mentally review all that must be said and all that must be asked, but I kept falling into Norrey's warm brown eyes and getting lost. The candle put highlights in them, and in her brown hair. I rummaged in my head for the right words.

"Well, here we are," is what I came up with.

Norrey half smiled. "That's a hell of a cold."

"My nose clamped down twenty hours after I hit dirt, and I've never properly thanked it. Do you have any *idea* how rotten this planet smells?"

"I'd have thought a closed system'd smell worse."

I shook my head. "There's a smell to space, to a space station I mean. And a p-suit can get pretty ripe. But Earth is a *stew* of smells, mostly bad."

She nodded judiciously. "No smokestacks in space."

"No garbage dumps."

"No sewage."

"No cow farts."

"How did she die, Charlie?"

Oof. "Magnificently."

"I read the papers. I *know* that's bullshit, and—and you were *there*."

"Yeah." I had told the story over a hundred times in the last three weeks—but I had never told a *friend*, and I discovered I needed to. And Norrey certainly deserved to know of her sister's dying.

And so I told her of the aliens, the swarm of red fireflies that had appeared out of nowhere and matched orbits with Skyfac. I told her of Shara's intuitive understanding that the beings communicated by dance, the universal language, and her instant decision to reply to them, how she slipped away from us all and went out the airlock to greet humanity's first visitors. I told her of Shara's slow realization that the aliens were hostile, territorially aggressive, determined to have our planet for a spawning ground. And I told her, as best I could, of the *Stardance*.

"She danced them right out of the solar system, Norrey. She danced everything she had in her—and she had all of us in her. She danced what we are, what she was, and she scared them silly. They weren't afraid of military lasers, but she scared 'em right the hell back to deep space. Oh, they'll be back *some* day—I don't know why, but I feel it in my bones. But it might not be in our lifetime. She told them what it is to be human. She gave them the *Stardance*."

Norrey was silent a long time, and then she nodded. "Uh huh." Her face twisted suddenly. "But why did she have to die, Charlie?"

"She was done, honey," I said and took her hand. "She was acclimated all

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the way to free fall by then, and it's a one-way street. She could never have returned to Earth, not even to the one-sixth gee in Skyfac. Oh, she could have lived in free fall. But Carrington owns everything in free fall except military hardware—and she didn't have any more reason to take anything from him. She'd danced her *Star-dance*, and I'd taped it, and she was done."

"Carrington," she said, and her fingers gripped my hand fiercely. "Where is he now?"

"I just found out myself this morning. He tried to grab all the tapes and all the money for Skyfac Incorporated, i.e., him. But he'd neglected to have Shara sign an actual contract, and Tom McGillicuddy found an airtight holograph will in her effects. It leaves everything fifty-fifty to you and me. So Carrington tried to buy a probate judge, and he picked the wrong judge. It would have hit the news this afternoon. I think at the last he convinced himself that he had actually loved her, because he tried to follow her. He bungled it. He didn't know anything about leaving a rotating Ring, and he let go too late. It's the most common beginner's error."

Norrey looked puzzled.

"Instead of becoming a meteorite like her, he was last seen heading in the general direction of Betelgeuse. I imagine it's on the news by now." I glanced at my watch. "In fact, I would estimate that he's just running out of air about now—if he had the guts to wait."

Norrey smiled, and her fingers relaxed. "Let's hold that thought," she purred.

If captured—don't let them give you to the women.

The salad arrived then. Thousand Islands for Norrey and French for me, just as we would have ordered if we'd thought of it. The portions were unequal, and each was *precisely* as much as the recipient felt like eating. I don't know how Fat Humphrey does it. At what point does that kind of empathy become telepathy?

There was further sporadic conversation as we ate, but nothing significant. Fat Humphrey's cuisine demanded respectful attention. The meal itself arrived as we were finishing the salad, and when we had eaten our fill, both plates were empty and the coffee was cool enough to drink. Slices of Fat's fresh apricot pie were produced warm from the oven, and reverently dealt with. More coffee was poured. I took some psuedoephedrine for my nose. The conversation reawoke groggily, and there was only one question left for her to ask now so I asked her first.

"So what's happening with you, Norrey?"

She made a face. "Nothing much really."

Lovely answer. Push.

"Norrey, on the day there is nothing much happening in your life, there'll be honest government in Ottowa. I hear you stood still, once, for over an hour—but the guy that said it was a famous liar. Come on, you know

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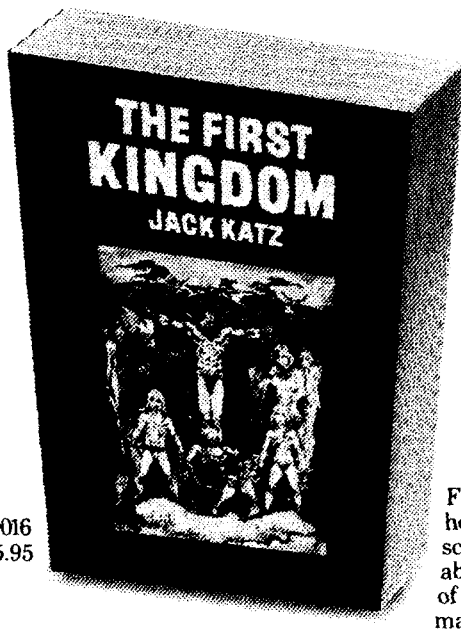

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I've been out of touch."

She frowned, and that was it for me, that was the trigger. I had been thinking furiously ever since I awoke in Norrey's arms back at the studio, and I had already figured out a lot of things. But the sight of that frown completed the process; all at once the jumble in my subconsious fell into shape with an almost audible click. They can come that way, you know. Flashes of insight. In the middle of a sentence, in a microsecond, you make a quantum jump in understanding. You look back on twenty years of blind stupidity without wincing, and perceive the immediate future in detail. Later you will marvel—at that instant you only accept and nod. The Sicilians have a thing like it, that they call *the thunderbolt*. It is said to bring deep calm and great gravity. It made me break up.

"What's so funny?"

"Don't know if I can explain it, hon. I guess I just figured out how Fat Humphrey does it."

"Huh?"

"Tell you later. You were saying what . . ."

The frown returned. "Mostly I wasn't saying. What's happening with me, in twenty-five words or less? I haven't asked myself in quite a while. Maybe too long." She sipped coffee. "Okay. You know that John Koerner album, that last commercial one he made? *Running Jumping Standing Still*? That's what I've been doing, I think. I've been putting out a lot of energy, doing satisfying things, and I'm not satisfied. I'm . . . I'm almost bored."

She floundered, so I decided to play devil's advocate. "But you're right where you've always wanted to be," I said, and began rolling a joint.

She grimaced. "Maybe that's the trouble. Maybe a life's ambition shouldn't be something that can be achieved—because what do you do then? You remember Koerner's movie?"

"Yeah. *The Sound of Sleep*. Nutball flick, nice cherries on top."

"Remember what he said the meaning of life was?"

"Sure. 'Do the next thing.'" I suited action to the word, licked it, sealed it and twisted the ends, then lit it. "Always thought it was terrific advice. It got me through some tough spots."

She toked, held it and exhaled before replying. "I'm ready to do the next thing—but I'm not sure what that *is*. I've toured with the company, I've soloed in New York, I've choreographed, I've directed the whole damn school and now I'm an artistic director. I've got full autonomy now; I can even teach a class again if I feel like it. Every year from now until hell freezes, TDT's repertoire will include one of my pieces, and I'll always have superb bodies to work with. I've been working on childhood dreams all my life, Charlie, and *I hadn't thought ahead any farther than this when I was a kid*. I don't know what 'the next thing' is. I need a new dream."

She toked again, passed it to me. I

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stared at the glowing tip conspiratorially, and it winked at me. "Any clues? Directions at least?"

She exhaled carefully, spoke to her hands. "I thought I might like to try working with one of those commune companies, where everybody choreographs every piece. I'd like to try working with a group-head. But there's really no one here I could start one with, and the only existing group-head that suits me is New Pilobolus—and for that I'd have to live in *America*."

"Forget that."

"Hell, yes. I . . . Charlie, I don't know, I've even thought of chucking it all and going out to Prince Edward Island to farm. I always meant to, and never really did. Shara left the place in good shape, I could . . . oh, that's crazy. I don't really want to farm. I just want *something new*. Something different. Unmapped territory, something that—Charlie Armstead, what the hell are you grinning about?"

"Sometimes it's purely magical."

"What?"

"Listen. Can you hear them up there?"

"Hear who?"

"I oughta tell Humphrey. There's gonna be reindeer shit all over his roof."

"Charlie!"

"Go ahead, little girl, tug on the whiskers all you want—they're real. Sit right here on my lap and place your order. Ho ho ho. Pick a number from one to two."

She was giggling now; she didn't know why but she was giggling. "Charlie, come on now . . ."

"Pick a number from one to two."

"Two."

"That's a very good number. A very good number. You have just won one perfectly good factory-fresh dream, with all accessories and no warranty at all. This offer is not available through the stores. A very good number. How soon can you leave town?"

"Leave town! Charlie . . ." She was beginning to get a glimmer. "You can't mean—"

"How would you like a half-interest in a lot of vacuum, baby? I got *plenty* o' nuttin', or at least the use of it, and you're welcome to all you want. Talk about being on top of the world!"

The giggle was gone. "Charlie, you can't mean what I think you—"

"I'm offering you a simple partnership in a commune company—a *real* commune company, I mean, we'll all have to live together for the first season at least. *Lots* of real estate, but a bit of a housing shortage at first. We'll spring for expenses, and it's a free fall."

She leaned across the table, put one elbow in her coffee and the other in her apricot pie, grabbed my turtleneck and shook me. "Stop babbling and tell me straight, dammit."

"I am, honey, I am. I'm proposing a company of choreographers, a true commune. It'll have to be. Company members will live together, choreograph every piece together, perform together, share equally in the profits, and I'll put up all the expenses just for the hell of it. Oh yeah, we're rich, did

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I tell you? About to be, anyway."

"Charlie—"

"I'm straight, I tell you. I'm starting a company. And a school. I'm offering you a half-interest and a full-time year-round job, dead serious, and I'll need you to start right away. Norrey, I want you to come dance in free fall."

Her face went blank. "How?"

"I want to build a studio in orbit and form a company. We'll alternate performing with school like so: three months of classes dirtside—essentially auditions—and the graduates get to come study for three months in orbit. Any that are any good, we work into the next three months of performance taping. By then we've been in low or no gee for a long time, our bodies are starting to adapt, so we take three months vacation on Earth and then start the process over again. We can use the vacations to hunt out likely talent and recruit 'em—go concert hopping, in other words. It'll be *fun*, Norrey. We'll make history and money both."

"*How*, Charlie? How are you going to get the backing for all this? Carrington's dead, and I won't work for his associates. Who else but Skyfac and the Space Command have space capacity?"

"Us."

"?"

"You and me. We *own* the *Stardance* tape, Norrey. I'll show it to you later, I have a dub in my pouch. At this point maybe a hundred people on Earth and a few dozen in space have seen that tape in its entirety. One of them was the president of Sony. He offered me a blank check."

"A blank—"

"Literally. Norrey, the *Stardance* may be the single most magnificent artistic utterance of man—irrespective of its historical importance and news value. I would estimate that within five years every sighted person in the solar system will know it. And we own the only tape. *And*, I own the only existing footage of Shara dancing on Earth, commercial value incalculable. Rich? Hell, we're *powerful*! Skyfac Incorporated is so anxious to come out of this looking good that if I phone up to Ring One and ask Tokugawa for the time, he'll take the next elevator down and show me his watch."

Her hands dropped from my sweater. I wiped apricot from one limp elbow, dried the other.

"I don't feel squeamish about profiting from Shara's death. We made the *Stardance*, together, she and I: I earned my half and she left you hers. The only thing wrong with that is that it leaves me filthy rich, and I don't want to be rich—not on *this* planet. The only way I can think of to piss away that kind of money in a way Shara would have approved is to start a company and a school. We'll specialize in misfits, the ones who for one reason or another don't fit into the mold here on Earth. Like Shara. The oddballs. The less than classically perfect dancer's bodies. That stuff is just irrelevant in space. More important is the ability to open yourself, to learn a

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whole new kind of dance, to . . . I don't know if this will make any sense . . . to encompass three hundred and sixty degrees. We'll be making the rules as we go along—and we'll employ a lot of dancers that aren't working now. I figure our investment capital is good for about five years. By that time the performing company should be making enough to cover the nut, underwrite the school, and still show a profit. All company members share equally. Are you in?"

She blinked, sat back and took a deep breath. "In what? What have you got?"

"Not a damn thing," I said cheerily. "But I know what I need. It'll take us a couple of years to get started at the very least. We'll need a business manager, a stage manager, three or four other dancers who can teach. A construction crew to get started, of course, and an elevator operator, but they're just employees. My cameras run themselves, by Christ, and I'll be my own gaffer. I can do it, Norrey—if you'll help me. Come on—join my company and see the world—from a decent perspective."

"Charlie, I . . . I don't even know if I can *imagine* free fall dance. I mean, I've seen both of Shara's shows several times of course, and I liked them a lot—but I still don't know where you could go from there. I can't picture it."

"Of course not! You're still hobbled with 'up' and 'down,' warped by a lifetime in a gravity well. But you'll catch on as soon as you get up there, believe me." (A year from now, my blithe confidence would haunt me.) "You can learn to think spherically, I know you can, and the rest is just recoordination, like getting sea legs. Hell, if I can do it at my age, anybody can. You'll make a *good* dancing partner."

She had missed it the first time. Now her eyes enlarged.

"A good *what*?"

Norrey and I go back a long time, and I'd have to tell you about most of it to explain how I felt just then. Remember when Alistair Sim, as Scrooge, has just woken from his nightmare and vowed to make amends? And the more nice things he does, and the more people gape at him in bafflement, the more he giggles? And finally he slaps himself in the face and says, "I don't deserve to be this happy," and tries to get properly chaste? And then he giggles again and says, "But I just can't help myself," and breaks up all over again? *That's* how I felt. When a hangup of yours has been a burden to a friend for so many years, and all at once you not only realize that, but know that the burden is lifted, for both of you, there is exquisite joy in sharing the news.

Remember how Scrooge sprung it on Bob Cratchit; "leaving me no alternative—but to raise your salary!" In the same childish way I had saved this, my *real* surprise Santa Claus announcement, for last. I intended to savor the moment.

But then I saw her eyes and I just said it flat out.

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"The leg is functional in free fall, Norrey. It's a little stiff, and I'll—we'll—always have to choreograph around it to some extent. But it does everything a weightless dancer needs it to. *I can dance again.*"

She closed her eyes, and the lids quivered. "Oh my God." Then she opened them and laughed and cried at once, "Oh my God, Charlie, oh my God, oh my God," and she reached across the table and grabbed my neck and pulled me close and I got apricot and coffee on my own elbows, and oh her tears were hot on my neck.

The place had gotten busy while we talked; no one seemed to notice us: I held her head in the hollow of my throat, and marveled. The only true measure of pain is relief—only in that moment, as layers of scar tissue sloughed off my heart, did I perceive their true weight for the first time.

Finally we were both cried out, and I pulled back and sought her eyes. "I can dance again, Norrey. It was Shara showed me, I was too damn dumb to notice, too blocked to see it. It was about the last thing she ever did. I can't throw that away now, I've got to dance again, you see? I'm going to go back to space and dance, on my own property and on my own terms and fucking dance again.

"And I want to dance with *you*, Norrey. I want you to be my partner. I want you to come dance with me. Will you come?"

She sat up straight and looked me in the eye. "Do you know what you are asking me?"

Hang on—here we go! I took a deep breath. "Yes. I'm asking for a full partnership."

She sat back in her chair and got a faraway look. "How many years have we known each other, Charlie?"

I had to think. "I make it twenty-four years, off and on."

She smiled. "Yeah. Off and on." She retrieved the forgotten joint and relit it, took a long hit. "How much of that time do you estimate we've spent living together?"

More arithmetic; I toked while I computed. "Call it six or seven years." Exhale. "Maybe eight."

She nodded reflectively and took the joint back. "Some pretty crumby times."

"Norrey—"

"Shut up, Charlie. You waited twenty-four years to propose to me, you can shut up and wait while I give you my answer. How many times would you estimate I came down to the drunk tank and bailed you out?"

I didn't flinch. "Too many."

She shook her head. "One less than too many. I've taken you in when you needed it and thrown you out when you needed it and never once said the word 'love,' because I knew it would scare you away. You were so damned afraid that anyone might love you, because then they'd have to pity you for being a cripple. So I've sat by and watched you give your heart only to people who wouldn't take it—and then picked up the pieces every time."

"Norrey—"

"Shut up, I said. Smoke this digit

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and shut up. I've loved you since before you knew me, Charlie, before your leg got chopped up, when you were still dancing. I knew you before you were a cripple. I loved you before I ever saw you offstage. I knew you before you were a lush, and I've loved you all the years since in the way that you wanted me to.

"Now you come before me on two legs. You still limp, but you're not a cripple any more. Fat Humphrey the telepath doesn't give you wine with your meal, and when I kiss you at the studio I notice you didn't have a drink on the plane. You buy me dinner and you babble about being rich and powerful and you try to sell me some crack-brained scheme for dancing in space, you have the goddam *audacity* to lay all this on me and *never once say the word 'love' with your mouth* and ask me to be your other half again." She snatched the roach out of my hand. "Goddammit, Cratchit, you leave me no alternative . . ."

And she actually paused and toked and held it and exhaled before she let the smile begin. ". . . but to raise your bloody salary."

And we were both holding hands in the apricots and grinning like gibbons. Blood roared in my ears; I literally shuddered with emotion, too intense to bear. I groped for a cathartic wisecrack. "Who said I was buying dinner?"

A high, nasal voice from nearby said, "I'm buying, Mr. Armstead."

We looked up, startled to discover that the world still existed around us, and were further startled.

He was a short, slight young man. My first impression was of cascades of ringlets of exceedingly curly black hair, behind which lurked a face like a Brian Froud drawing of a puckish elf. His glasses were twin rectangles of wire and glass, thicker than the glass in airlock doors, and at the moment they were on the end of his nose. He squinted down past them at us, doing his best to look dignified. This was considerably difficult, as Fat Humphrey was holding him a clear foot off the floor, one big sausage-plate fist clutching his collar. His clothes were expensive and in excellent taste, but his boots were splendidly shabby. He was trying, unsuccessfully, not to kick his feet.

"Every time I pass your table I keep steppin' on his ears," Humphrey explained, bringing the little guy closer and lowering his voice. "So I figure him for a snoop or a newsie and I'm just givin' him the bum's rush. But if he's talkin' about buyin', it's your decision."

"How about it, friend? Snoop or newsie?"

Insofar as it was possible, he drew himself up. "I am an artist."

I queried Norrey with my eyes and was answered.

"Set that man down and get him a chair, Fat. We'll discuss the check later."

This was done, and the kid accepted the last of the roach, hitching his tunic into shape and pushing his glasses back up.

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"Mr. Armstead, you don't know me, and I don't know this lady here, but I've got these terrific ears and no shame at all. Mr. Pappadopolous is right, I was eavesdropping just great. My name is Raoul Brindle, and—"

"I've heard of you," Norrey said. "I have a few of your albums."

"I do too," I agreed. "The next to last one was terrific."

"Charlie, that's a terrible thing to say."

Raoul blinked furiously. "No, he's right. The last one was trash. I owed a pound and paid."

"Well, I liked it. I'm Norrey Drummond."

"You're Norrey *Drummond*?"

Norrey got a familiar look. "Yes. Her sister."

"Norrey Drummond of TDT, who choreographed 'Shifting Gears' and danced the 'Question An Dancer' variations at the Vancouver conference, who—?" He stopped, and his glasses slid down his nose. "Ohmigod. Shara Drummond is your *sister*? Ohmigod, of course, Drummond Drummond, sisters, imbecile." Norrey was grinning broadly. He sat on his excitement and hitched up his glasses and tried to look dignified some more.

For my money he pulled it off. I knew something about Raoul Brindle, and I was impressed. He'd been a child-genius composer, and then in his college days he decided music was no way to make a living and became one of the best special effects men in Hollywood. Right after *Time* did a half-page sidebar on his work on *Children of the Lens*—which I mightily admired—he released a videocassette album composed entirely of extraordinary visuals, laser optics and color effects, with synthesizer accompaniment of his own. It was sort of *Yellow Submarine* cubed, and it had sold like hell, and been followed by a half dozen more occasionally brilliant albums. He had designed and programmed the Beatles' legendary million-dollar lightshow system for their reunion as a favor for McCartney, and one of his audio-only tapes followed my deck everywhere it went. I resolved to buy *his* dinner.

"So how do you know me well enough to spot me in a restaurant, Raoul, and why have you been dropping eaves?"

"I didn't spot you here. I followed you here."

"Sonofabitch, I never saw you. Well, what did you follow me for?"

"To offer you my life."

"Eh?"

"I've seen the *Stardance*."

"You *have*?" I exclaimed, genuinely impressed. "How did you pull that off?"

He looked up at the ceiling. "Large weather we're having, isn't it? So I saw the *Stardance* and I made it my business to find you and follow you, and now you're going back to space to dance and I'm going with you. If I have to walk."

"And do what?"

"You said yourself, you're going to need a stage manager. But you haven't thought it through. I'm going to cre-

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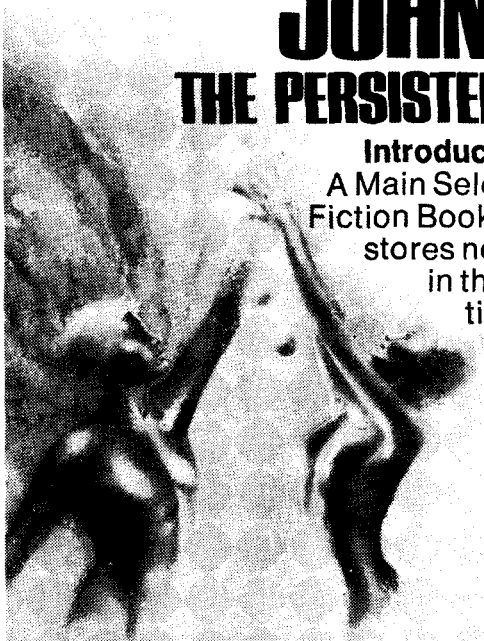
"Dizzying Virtuosity

and just damned *good!*" said Harlan Ellison about John Varley's first novel, THE OPHIUCHI HOTLINE. The nine stories in THE PERSISTENCE OF VISION—many about a bizarre future in which genetic engineering, sex changes and arcane pleasures and trades are commonplace—display that originality in all its breathtaking brilliance.



JOHN VARLEY
THE PERSISTENCE OF VISION

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ate a new art form for you. I'm going to beat my brains to peanut butter for you. I'm going to design free fall sets and visuals and do the scores, and they'll both work integrally together and with the dances. I'll work for coffee and cakes, you don't even have to use my music if you don't want to, but I *gotta* design those sets."

Norrey cut him off with a gentle, compassionate hand over his mounth. "How do you mean, free fall sets?" She took her hand away.

"It's *free fall*, don't you understand? I'll design you a sphere of trampolines, with cameras at the joints, and the framework'll be tubes of colored neon. For free space work I'll give you rings of laser-lit metal flakes, loops of luminous gas, modified fireworks, giant blobs of colored liquid hanging in space to dance around and through—singing Jesus, as a special effects man I've been waiting all my *life* for zero gravity. It—it makes the Dykstraflex obsolete, don't you see?"

He was blinking hard enough to keep the insides of his glasses swept, glancing rapidly back and forth from Norrey to me. I was flabbergasted, and so was she.

"Look, I've got a microcassette deck here. I'll give it to you, Mister Armstead—"

"Charlie," I corrected absently.

"—and you take it home and listen. It's just a few tracks I cut after I saw the *Stardance*. It's just audio, just first impressions. I mean, it's not even the frame of a score, but I thought it . . . I mean, I thought maybe you'd . . . it's completely shitful, here, take it."

"You're hired," I said.

"Just promise me you'll *hired*?"

"Hired. Hey, Fat! You got a Betamax in the joint somewhere?"

So we went into the back room where Fat Humphrey Pappadopolous lives, and I fed the *Stardance* tape into his personal television, and the four of us watched it together while Maria ran the restaurant, and when it was over it was half an hour before any of us could speak.

CHAPTER TWO

So of course there was nothing to do then but go up to Skyfac.

Commercial transportation to orbit is handled by Space Industries Corp., a Skyfac subsidiary, and I have to congratulate them on one of the finest natural puns I've ever seen. When we located the proper gate at the spaceport, after hours of indignity at Customs and Medical, I was feeling salty. I still hadn't fully readapted after the time I'd spent in free fall with Shara, and the most I could pry out of the corporation medicos was three weeks—my "pull" with the top brass meant nothing to the flight surgeon in charge. I was busy fretting that it wasn't enough time and tightening my guts in anticipation of takeoff when I rounded the last corner and confronted the sign that told me I was in the right place.

It said:

S.I.C. TRANSIT
(gloria mundi)

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I laughed so hard that Norrey and Raoul had to help me aboard and strap me in, and I was still chuckling when acceleration hit us.

Sure enough, Raoul got spacesick as soon as the drive cut off—but he'd been sensible enough to skip breakfast, and he responded rapidly to the injection. That banty little guy had plenty of sand: by the time we were docked at Ring One he was trying out riffs on his Soundmaster. White as a piece of paper and completely oblivious, eyes glued to the outboard video, fingers glued to the Soundmaster's keyboard, ears glued to its pickups. If elevator-belly ever troubled him again, he kept it to himself.

Norrey had no trouble at all. Neither did I: my leg was glad to be home. Our appointment with the brass had been set for an hour hence, just in case, so we stashed Raoul in the room assigned to him and spent the time in the lounge, watching the stars wheel by on the big video wall. My attempts to play seasoned old spacehound to her breathless tourist were laughably unsuccessful. No one *ever* gets jaded to space, and I took deep satisfaction in being the one who introduced Norrey to it.

The meeting with Tokugawa, the new Chairman of the Board, was low comedy. He received us personally in what had been Carrington's office, and the overall effect was of a country bishop on the Pope's throne. Or perhaps "tuna impersonating a piranha" is closer to the image I want. Tom McGillicuddy was with him, which delighted me. The broken ankle Shara had been forced to give him, on her way out the airlock for the last time, was nearly healed, and he appeared to be growing a beard. We exchanged greetings, I introduced him to Norrey, and *then* we allowed Tokugawa to introduce himself.

He was a hard man to insult: his opening speech was a magnanimous offer to become our patron, to underwrite all our expenses and overhead. An absolutely free lunch, he said: he didn't even want a percentage of the *net*. Just the privilege of helping to bring our great art to the world. I was at least listening politely up to that point, but when he finished, ". . . as Bryce Carrington did for Shara Drummond," I lost my temper and stopped being polite.

Skyfac Incorporated *needed* us. Antitrust actions had been filed against them the month before, the first salvos in what would become the legal battle of the century—and Skyfac's single major asset was its monopoly of space. It was worth billions to them; they needed all the good PR they could get.

And the *week* before, the *Stardance* tape had been released. We were the best PR Tokugawa was ever liable to get. He wanted us as Skyfac's in-house troupe, and he wanted our cooperation with his PR people, and he wanted one other thing most of all: he wanted our written pledge not to sell any interviews, articles or memoirs detailing Bryce Carrington's relationship with Shara, or the rental he had charged

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her for use of his property, without prior approval from the Board of Directors.

I told him all this in the baldest of terms, daring him to deny any of it, and when he failed to do so I made my counterproposal: we would build our own studio, in an entirely different orbital neighborhood, and we would damn well be *independents*. We would graciously permit Skyfac and its subsidiary Lunindustries Inc. to sell us air, food, water, and materials at cost, and to let us hire away trained personnel for as long as we needed them. In return we offered to cooperate with their PR people, within arbitrary limits, and to develop auditory dysfunction any time we were asked about Bryce Carrington. I personally promised, as a show of good faith, not to publish any memoirs implying that Carrington had caused Shara's death by forcing her to spend so many offstage hours in the only environment in which he could get it up—free fall—for a period of twenty years or until Skyfac Incorporated pissed me off, whichever came first. Then, pausing only long enough to hire Tom McGillicuddy, his personal executive secretary, out from under his face, we left Tokugawa.

Perhaps I was too hard on him. But he was Carrington's heir.

We left Tom in our cabin with four full briefcases of paperwork to sort out, and went to see Harry Stein.

We found him where I expected to, in a secluded corner of the metals shop, behind a desk with stacks of pamphlets, journals, and papers that would have been improbable in a full gee. He and a Tensor lamp were hunched over an incredibly ancient typewriter. One massive roll fed clean paper into it, another took up the copy. I noted with approval that the manuscript's radius was two or three centimeters thicker than when last I'd seen it. "Say hey, Harry. Finishing up chapter one?"

He looked up, blinked. "Hey, Charlie, Good to see you." For him it was an emotional greeting. "You must be her sister."

Norrey nodded gravely. "Hi, Harry. I'm glad to meet you. I hear those candles in *Liberation* were your idea."

Harry shrugged. "She was okay." He nodded.

"Yes," Norrey agreed. Unconsciously, instinctively, she was taking on his economical word usage—as Shara had before her.

"I," I said, "will drink to that proposition."

Harry eyed the thermos on my belt, and raised an eyebrow in query.

"Not booze," I assured him, unclipping it. "On the wagon. Jamaican Blue Mountain coffee, fresh from Japan. Real cream. Brought it for you." Damn it, I was doing it too.

Harry actually smiled. He produced three mugs from a nearby coffeemaker unit (personally adapted for low gee), and held them while I poured. The aroma diffused easily in low gee; it was exquisite. "To Shara Drum-

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mond," Harry said, and we drank together. Then we shared a minute of warm silence.

Harry is a fifty-year-old ex-fullback who has kept himself in shape. He's so massive and formidably packed that you could know him a long time without ever suspecting his intelligence, let alone his genius—unless you happened to watch him work. He speaks mostly with his hands. He hates writing, but puts in two methodical hours a day on The Book. By the time I asked him why, he trusted me enough to answer. "Somebody's gotta write a book on space construction," he said. Certainly no one could be better qualified. Harry literally made the first weld on Skyfac, and had bossed virtually all construction since. There was another guy who had as much experience, once, but he died (His "suit sold out," as the spacemen say: lost its integrity). Harry's writing is astonishingly lucid for such a phlegmatic man (perhaps because he does it with his fingers), and I knew even then that The Book was going to make him rich. It didn't worry me; Harry will never get rich enough to retire.

"Got a job for you, Harry, if you want it."

He shook his head. "I'm happy here."

"It's a space job."

He damn near smiled again. "I'm unhappy here."

"All right, I'll tell you about it. My guess is a year of design work, three or four years of heavy construction, and then a kind of permanent maintenance job keeping the whole thing running for us."

"What?" he asked economically.

"I want an orbiting dance studio."

He held up a hand the size of a baseball glove, cutting me off. He took a minicorder out of his shirt, set the mike for ambient and put it on the desk between us. "What do you want it to *do*?"

Five and a half hours later all three of us were hoarse, and an hour after that Harry handed us a set of sketches. I looked them over with Norrey, we approved his budget, and he told us a year. We all shook hands.

Ten months later I took title.

We spent the next three weeks in and around Skyfac property, while I introduced Norrey and Raoul to life without up and down. Space overawed them both at first. Norrey, like her sister before her, was profoundly moved by the personal confrontation of infinity, spiritually traumatized by the awesome perspective that the Big Deep brings to human values. And unlike her sister before her, she lacked that mysteriously total self-confidence, that secure ego-strength that had helped Shara to adjust so quickly. Few humans have ever been as sure of themselves as Shara was. Raoul, too, was only slightly less affected.

We all get it at first, we who venture out into space. From the earliest days, the most unimaginative and stolid jocks NASA could assemble for astronauts all came back down spiritually and emotionally staggered, and some

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adapted and some didn't. The ten percent of Skyfac personnel who spend much time EVA, who have any way of knowing they're not in Waukegan besides the low gee, often have to be replaced, and no worker is depended on until his or her second tour. Norrey and Raoul both came through it—they were able to expand their personal interior universe to encompass that much external universe, and came out of the experience (as Shara and I had) with a new and lasting inner calm.

The spiritual confrontation, however, was only the first step. The major victory was much subtler. It was more than just spiritual malaise that washed out seven out of ten exterior construction workers in their first tour: it was also physiological—or was it psychological?—distress.

Free fall itself they both took to nearly at once. Norrey was much quicker than Raoul to adapt—as a dancer, she knew more about her reflexes, and he was more prone to forget himself and blunder into impossible situations, which he endured with dogged good humor. But both were proficient at "jaunting," propelling oneself through an enclosed space, by the time we were ready to return to Earth.

The real miracle was their equally rapid acclimation to sustained EVA, to extended periods outdoors in free space. Given enough time, nearly anyone can acquire new reflexes. But startlingly few can learn to live without a local vertical.

I was so ignorant at that time that I hadn't the slightest *idea* what an incredible stroke of good fortune it was that both Norrey and Raoul could. No wonder the gods smile so seldom—we so often fail to notice. Not until the next year did I realize how narrowly my whole venture—my whole life—had escaped disaster. When it finally dawned on me, I had the shakes for days.

That kind of luck held for the next year.

That first year was spent in getting the ball rolling. Endless millions of aggravations and petty details—have you ever tried to order dancing shoes for *hands?* With velcro palms? So few of the things we needed could be ordered from the Johnny Brown catalog, or put together out of stock space hardware. Incredible amounts of imaginary dollars flowed through my and Norrey's right hands, and but for Tom McGillicuddy the thing simply would not have been possible. He took care of incorporating both the Shara Drummond School of New Modern Dance and the performing company, Stardancers, Inc., and became business manager of the former and agent for the latter. A highly intelligent and thoroughly honorable man, he had entered Carrington's service with his eyes—and his ears—wide open. When we waved him like a wand, magic resulted. How many honest men understand high finance?

The second indispensable wizard was, of course, Harry. And bear in

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mind that during five of those ten months, Harry was on mandatory dirtside leave, readapting his body and bossing the job by extreme long distance phone. (God, I hated having phones installed—but the phone company's rates were fractionally cheaper than buying our own orbit-to-Earth video equipment, and of course it tied the studio into the global net.) Unlike the majority of Skyfac personnel, who rotate dirtside every fourteen months, construction men (those who make it) spend so much time in total weightlessness that six months is the recommended maximum. I figured us Stardancers for the same shift, and Doc Panzarella agreed. But the first month and the last four were under Harry's direct supervision, and he actually turned it in under budget—doubly impressive considering that much of what he was doing had never been done before. He would have beat his original deadline; it wasn't his fault that we had to move it up on him.

Best of all, Harry turned out (as I'd hoped) to be one of those rare bosses who would rather be working with his hands than bossing. When the job was done he took a month off to collate the first ten inches of copy on his takeup reel into The First Book, sold it for a record-breaking advance and Santa Claus royalties, and then hired back on with us as set-builder, prop man, stage manager, all around maintenance man, and resident mechanic. Tokugawa's boys had made astonishingly little fuss when I hired Harry away from them. They simply did not know what they were missing—until it was *months* too late to do anything about it.

I was able to raid Skyfac so effectively only because it was what it was: a giant, heartless multinational that saw people as interchangeable components. Carrington probably knew better—but the backers he had gotten together and convinced to underwrite his dream knew even less about space than I had as a videoman in Toronto. I'm certain they thought of it, most of them, as merely an extremely foreign investment.

In retrospect, all of the above strokes of luck were utterly necessary for the Shara Drummond School of New Modern Dance to have become a reality in the first place. After so many interlocking miracles, I guess I should have been expecting a run of bad cards. But it sure didn't *look* like one when it came.

For we truly did have dancers coming out of our ears when we finally opened up shop. I had expected to need good PR to stimulate a demand for the expensive commodity, for although we absorbed the bulk of student expenses (we *had* to—how many could afford the $100-a-kilo elevator fee alone?) we kept it expensive enough to weed out the casually curious—with a secret scholarship program for deserving needy.

Even at those prices, I had to step lively to avoid being trampled in the stampede.

The cumulative effect of Shara's three tapes on the dance consciousness

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of the world had been profound and revolutionary. They came at a time when modern dance as a whole was in the midst of an almost decade-long stasis, a period in which everyone seemed to be doing variations on the already-done, in which dozens of choreographers had beat their brains out trying to create the next New Wave breakthrough, and produced mostly gibberish. Shara's three tapes, spaced as she had intuitively sensed they must be, had succeeded in capturing the imagination of an immense number of dancers and dance-lovers the world over—as well as millions of people who had never given dance a thought before. Dancers began to understand that free fall meant free dance, free from a lifetime in thrall to gravity. Norrey and I, in our naivete, had failed to be secretive enough about our plans. The day after we signed the lease on our dirtside studio in Toronto, students began literally arriving at our door in carloads and refusing to leave—much before we were ready for them. We hadn't even figured out how to audition a zero gee dancer on Earth yet. (Ultimately it proved quite simple: dancers who survived an elimination process based on conventional dance skills were put on a plane, taken up to angels thirty, dumped out, and filmed on the way down. It's not the *same* as free fall—but it's close enough to weed out gross unsuitables.) We were sleeping 'em like torpedomen at the dirtside school, feeding them in shifts, and I began having panicky second thoughts about calling up to Harry and putting off our deadline so he could triple the studio's living quarters. But Norrey convinced me to be ruthlessly selective and take ONLY the most promising ten—out of hundreds!—into orbit.

Thank God—we damned near lost three of those pigeons in two separate incidents, and we conclusively washed out nine. That run of bad cards I mentioned earlier.

Most often it came down to a failure to adapt, an inability to evolve the consciousness beyond dependence on up and down; the one factor skydiving *can't* simulate. A skydiver *knows* which way is down. It doesn't help to tell yourself that north of your head is "up" and south of your feet is "down"—from that perspective the whole universe is in endless motion (you're hardly ever motionless in free fall), a perception most brains simply reject. Such a dancer would persistently "lose his point," his imaginary horizon, and become hopelessly disoriented. Side effects included mild to extreme terror, dizziness, nausea, erratic pulse and blood pressure, the granddaddy of all headaches, and involuntary bowel movement.

(Which last is uncomfortable and embarrassing. P-suit plumbing makes country outhouses look good. Men have the classic "relief tube," of course, but for women and for defecation in either sex we rely on a strategic deployment of specially treated . . . oh hell, we wear a diaper and try to hold it until we get indoors. End of

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first inevitable digression.)

Even in inside work, in the Goldfish Bowl or Raoul's collapsible trampoline sphere, such dancers could not learn to overcome their perceptual distress. Having spent their whole professional lives battling gravity with every move they made, they found that they were lost without their old antagonist—or at least without the linear, right-angled perceptual set that it provided: we found that some of them could actually learn to acclimate to weightlessness inside a cube or rectangle, as long as they were allowed to think of one wall as the "ceiling" and its opposite as the "floor."

And in the one or two cases where their vision was adequate to the new environment, their bodies, their instruments, were not. The new reflexes just failed to jell.

They simply were not meant, any of them, to live in space. In most cases they left friends—but they all left.

All but one.

Linda Parsons was the tenth student, the one that didn't wash out, and finding her was good fortune enough to make up for the run of bad cards.

She was smaller than Norrey, almost as taciturn as Harry (but for different reasons), much calmer than Raoul, and more openhearted and giving than I will be if I live to be a thousand. In the villainous overcrowding of that first free fall semester, amid flaring tempers and sullen rages, she was the *only* universally loved person—I honestly doubt whether we could have survived without her. (I remember with some dismay that I seriously contemplated spacing a pimply young student whose only crime was a habit of saying "There you go" at every single pause in the conversation. *There he goes*, I kept thinking to myself, *there he goes* . . .

Some women can turn a room into an emotional maelstrom, simply by entering it, and this quality is called "provocative." So far as I know, our language has no word for the opposite of provocative, but that is what Linda was. She had a talent for getting people high together, without drugs, a knack for resolving irreconcilable differences, a way of brightening the room she was in.

She had been raised on a farm by a spiritual community in Nova Scotia, and that probably accounted for her empathy, responsibility, and intuitive understanding of group energy dynamics. But I think the single overriding quality that made her magic work was inborn: she genuinely loved people. It could not have been learned behavior; it was just too intrinsic.

I don't mean that she was a Pollyanna, nauseatingly cheerful and syrupy. She could be blistering if she caught you trying to call irresponsibility something else. She insisted that a high truth level be maintained in her presence, and she would not allow you the luxury of a hidden grudge, what she called "holding a stash on someone." If she caught you with such psychic dirty laundry, she would haul it right out in public and force you to clean it up. "Tact?" she said to me

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once. "I always understood that to mean a mutual agreement to be full of shit."

These attributes are typical of a commune child, and usually get them heartily disliked in so-called polite society—founded, as it is, on irresponsibility, untruth, and selfishness. But again, something innate in Linda made them work for her. She could call you a jerk to your face without triggering reflex anger; she could tell you publicly that you were lying without calling you a liar. She plainly knew how to hate the sin and forgive the sinner; and I admire that, for it is a knack I never had. There was never any mistaking or denying the genuine caring in her voice, even when it was puncturing one of your favorite bubbles of rationalization.

At least, that's what Norrey or I would have said. Tom, when he met her, had a different opinion.

"Look, Charlie, there's Tom."

I should have been fuming mad when I got out of customs. I felt a little uneasy *not* being fuming mad. But after six months of extraterrestrial cabin fever, I was finding it curiously difficult to dislike *any* stranger—even a customs man.

Besides, I was too *heavy* to be angry.

"So it is. Tom! Hey, Tom!"

"Oh my," Norrey said, "something's wrong."

Tom was fuming mad.

"Hell. What put the sand in his shorts? Hey, where're Linda and Raoul? Maybe there's a hassle?"

"No, they got through before we did. They must have taken a cab to the hotel already—"

Tom was upon us, eyes flashing. "So that's your paragon? Jesus Christ! Fucking bleeding heart, I'll wring her scrawny neck. Of all the—"

"Whoa! Who? Linda? What?"

"Oh Christ, later—here they come." What looked like a vigilante committee bearing torches was converging on us. "Now look," Tom said hurriedly through his teeth, smiling as though he'd just been guaranteed an apartment in Paradise, "give these bloodsuckers your best I mean your best shot, and *maybe* I can scavenge something from this fucking mess." And he was striding toward them, opening his arms and smiling. As he went I heard him mutter something under his breath that began with "Ms. Parsons," contained enough additional sibilants to foil the shotgun-mikes, and moved his lips not at all.

Norrey and I exchanged a glance. "Pohl's Law," she said, and I nodded (Pohl's Law, Raoul once told us, says that "Nothing is so good that somebody somewhere won't hate it," and vice versa). And then the pack was upon us.

"This way mister when does your next tape come over here please tell our viewers what it's really believe that this new artform is a valid passport or did you look this way Mr. Drummond is it true that you haven't been able to smile for the cameraman for the *Stardance*, weren't you going

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to look this way to please continue or are readers would simply love to Miss Drummond pardon me Miz Drummond do you think you're as good as your sister Sharon in the profits in their own country are without honor to welcome you back to Earth *this* way please," said the mob, over the sound of clicking, whirring, snapping, and whining machinery and through the blinding glare of what looked like an explosion at the galactic core seen from close up. And I smiled and nodded and said urbanely witty things and answered the rudest questions with good humor and by the time we could get a cab I *was* fuming mad. Raoul and Linda had indeed gone ahead, and Tom had found our luggage; we left at high speed.

"Bleeding Christ, Tom," I said as the cab pulled away, "next time schedule a press conference for the next day, will you?"

"*Goddamn it,*" he blazed, "you can have this job back any time you want it!"

His volume startled even the cabbie. Norrey grabbed his hands and forced him to look at her.

"Tom," she said gently, "we're your friends. We don't want to yell at you; we don't want you to yell at us. Okay?"

He took an extra deep breath, held it, let it out in one great sigh and nodded. "Okay."

"Now I know that reporters can be hard to deal with. I understand that, Tom. But I'm tired and hungry and my feet hurt like hell and my body's convinced it weighs three hundred and thirteen kilos and next time could we maybe just lie to them a little?"

He paused before replying, but his voice came out calm. "Norrey, I am really not an idiot. All that madness to the contrary, I *did* schedule a press conference for tomorrow, and I *did* tell everybody to have a heart and leave you alone today. Those jerks back there were the ones who ignored me, the sons of—"

"Wait a minute," I interrupted. "Then why the hell did we just give *them* a command performance?"

"Do you think I wanted to?" Tom growled. "What the hell am I going to say tomorrow to the honorable ones who got scooped? But I had no *choice*, Charlie. That dizzy bitch left me no choice. I had to give those crumbs *some*thing, or they'd have run what they had already."

"Tom, what are you talking about?"

"Linda Parsons, that's what I'm talking about, your new wonder discovery. Christ, Norrey, the way you went on about her over the phone, I was expecting . . . I don't know, anyway a professional."

"You two, uh, didn't hit it off?" I suggested.

Tom snorted. "First she calls me a tight-ass. Practically the first words out of her mouth. Then she says I'm ignorant, and I'm not treating her right. Treating her right, for Christ's sake. Then she chews me out for having reporters there—and Charlie, I'll take that from you and Norrey, I *should've* had those jerks thrown out,

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but I don't have to take that crap from a rookie. So I start to explain about the reporters, and *then* she says I'm being defensive. Christ on the pogie, if there's anything I hate it's somebody that comes on aggressive and then says you're being defensive, smiling and looking you right in the eye and trying to rub my frigging *neck*!"

I figured he'd let off enough steam by now, and I was losing count of the grains of salt. "So Norrey and I made nice for the newsies because they taped you two squabbling in public?"

"*No*!"

We got the story out of him eventually. It was the old Linda magic at work again, and I can offer you no more typical example. Somehow a seventeen-year-old girl had threaded her way through the hundreds of people in the spaceport terminal straight to Linda and collapsed in her arms, sobbing that she was tripping and losing control and would Linda please make it all *stop*? It was at that point that the mob of reporters had spotted Linda as a Stardancer and closed in. Even considering that she weighed six times normal, had just been poked full of holes by Medical and insulted by Immigration, and was striking large sparks off of Tom, I'm inclined to doubt that Linda lost her temper; I think she abandoned it. Whatever, she apparently scorched a large hole through that pack of ghouls, bundled the poor girl through it and got her a cab. While they were getting in, some clown stuck a camera in the girl's face and Linda decked him.

"Hell, Tom, I might have done the same thing myself," I said when I got it straight.

"*God's teeth, Charlie*!" he began; then with a superhuman effort he got control of his voice (at least). "Look. Listen. This is not some two-bit penny ante game we are playing here. Megabucks pass through my fingers, Charlie, megabucks! You are not a bum any more, you don't have the privileges of a bum. Do you—"

"Tom," Norrey said, shocked.

"—have any *idea* how fickle the public has become in the last twenty years? Maybe I've got to tell you how much public opinion has to do with the *existence* of that orbiting junkheap you just left? Or maybe you're going to tell me that those tapes in your suitcase are as good as the *Stardance*, that you've got something so hot you can beat up reporters and get away with it. Oh *Jesus*, what a mess!"

He had me there. All the choreography plans we had brought into orbit with us had been based on the assumption that we would have between eight and twelve dancers. We had thought we were being pessimistic. We had to junk everything and start from scratch. The resulting tapes relied heavily on solos—our weakest area at that point—and while I was confident that I could do a lot with editing, well . . .

"It's okay, Tom. Those bums got something their editors'll like better than a five-foot lady making gorillas look like gorillas—they worry a little

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about public opinion, too."

"And what do I tell Westbrook tomorrow? And Mortie and Barbara Frum and UPI and AP and—"

"Tom," Norrey interrupted gently, "it'll be all right."

"All right? How is it all right? Tell me how it's all right."

I saw where she was going. "Hell, yeah. I never thought of that, hon, of *course*. That pack o' jackals drove it clean out of my mind. Serves 'em right." I began to chuckle. "Serves 'em bloody right."

"If you don't mind, darling."

"Huh? Oh. No . . . no, I don't mind." I grinned. "It's been long enough coming. Let's do it up."

"Will somebody *please* tell me what the hell is—"

"Tom," I said expansively, "don't worry about a thing. I'll tell your scooped friends the same thing I told my father at the age of thirteen, when he caught me in the cellar with the mailman's daughter."

"What the hell is that?" he snapped, beginning to grin in spite of himself and unsure why.

I put an arm around Norrey. " 'It's okay, Pa. We're engaged.' "

He stared at us blankly for several seconds, the grin fading, and then it returned full force.

"Well I'll be dipped in shit," he cried. "Congratulations! That's terrific, Charlie, Norrey, oh congratulations you two—it's about time." He tried to hug us both, but at that moment the cabbie had to dodge a psychopath and Tom was flung backwards, arms outstretched. "That's tremendous, that's . . . you know, I think that'll do it—I think it'll work." He had the grace to blush. "I mean, the hell with the reporters, I just—I mean—"

"You may always," Norrey said gravely, "leave these little things to us."

And broke us all up.

The desk phoned me when Linda checked in, as I had asked them to. I grunted, hung the phone up on thin air, stepped out of bed and into a hotel wastebasket, cannoned into the bedside table destroying table and accompanying lamp, and ended up prone on the floor with my chin sunk deep into the pile rug and my nose a couple of centimeters from a glowing clockface that said it was 4:42. In the morning. At the moment that I came completely awake, the clock expired and its glow went out.

Now it was *pitch* dark.

Incredibly, Norrey still had not awakened. I got up, dressed in the dark and left, leaving the wreckage for the morning. Fortunately the good leg had sustained most of the damage; I could walk, albeit with a kind of double limp.

"Linda? It's me, Charlie."

She opened up at once. "Charlie, I'm sorry—"

"Skip it. You done good. How's the girl?" I stepped in.

She closed the door behind me and made a face. "Not terrific. But her people are with her now. I think she's

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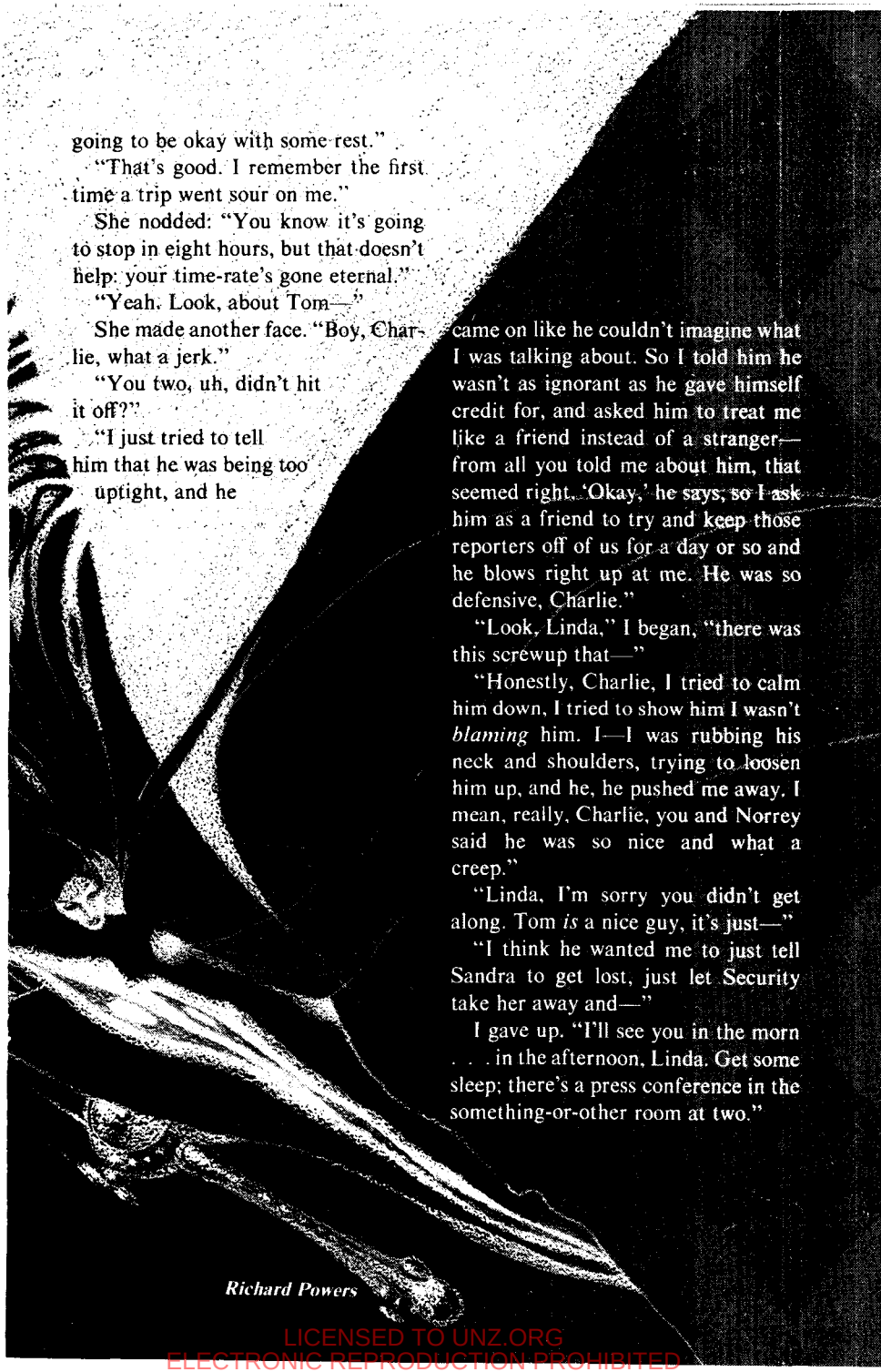

going to be okay with some rest."

"That's good. I remember the first time a trip went sour on me."

She nodded: "You know it's going to stop in eight hours, but that doesn't help: your time-rate's gone eternal."

"Yeah. Look, about Tom—"

She made another face. "Boy, Charlie, what a jerk."

"You two, uh, didn't hit it off?"

"I just tried to tell him that he was being too uptight, and he came on like he couldn't imagine what I was talking about. So I told him he wasn't as ignorant as he gave himself credit for, and asked him to treat me like a friend instead of a stranger—from all you told me about him, that seemed right. 'Okay,' he says, so I ask him as a friend to try and keep those reporters off of us for a day or so and he blows right up at me. He was so defensive, Charlie."

"Look, Linda," I began, "there was this screwup that—"

"Honestly, Charlie, I tried to calm him down, I tried to show him I wasn't *blaming* him. I—I was rubbing his neck and shoulders, trying to loosen him up, and he, he pushed me away. I mean, really, Charlie, you and Norrey said he was so nice and what a creep."

"Linda, I'm sorry you didn't get along. Tom *is* a nice guy, it's just—"

"I think he wanted me to just tell Sandra to get lost, just let Security take her away and—"

I gave up. "I'll see you in the morn . . . in the afternoon, Linda. Get some sleep; there's a press conference in the something-or-other room at two."

Richard Powers

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"Sure. I'm sorry, it must be late, huh?"

I met Raoul in the corridor—the desk had called him right after me, but he woke up slower. I told him that Linda and patient were doing as well as could be expected, and he was relieved. "Cripes, Charlie, her and Tom, you shoulda seen 'em. Cats and dogs, I never would have believed it."

"Yeah, well, sometimes your best friends just can't stand each other."

"Yeah, life's funny that way."

On that profundity I went back to bed. Norrey was still out cold when I entered, but as I climbed under the covers and snuggled up against her back she snorted like a horse and said, "Awright?"

"All right," I whispered, "but I think we're going to have to keep those two separated for a while."

She rolled over, opened one eye and found me with it. "Darl'n," she mumbled, smiling with that side of her mouth, "there's hope for you yet."

And then she rolled over and went back to sleep, leaving me smug and fatuous and wondering what the hell she was talking about.

CHAPTER THREE

Those first semester tapes sold like hell anyway, and the critics were more than kind, for the most part. Also, we rereleased *Mass Is A Verb* with Raoul's soundtrack at that time, and finished our first fiscal year well in the black.

By the second year, our studio was taking shape.

We settled on a highly elongated orbit. At perigee the studio came as close as 3200 kilometers to Earth (not very close—Skylab was up only about 400 klicks), and at apogee it swung way out to about 80,000 klicks. The point of this was to keep Earth from hogging half the sky in every tape: at apogee it was about fistsized (subtending a little more than 9° of arc), and we spent most of our time out there (Kepler's Second Law: the closer a satellite to its primary, the faster it swings around). Since we made a complete orbit almost twice a day, that gave two possible taping periods of almost eight hours apiece in every twenty-four hours. We simply adjusted our "inner clocks," our biological cycle, so that one of these two periods came between "nine" and "five" subjective. (If we fudged a shot, we had to come back and reshoot some multiple of eleven hours later to get a background Earth of the proper size.)

As to the studio complex itself:

The largest single structure, of course, was the Fishbowl, an enormous sphere for inside work, without p-suits. It is effectively transparent when correctly lit, but can be fitted with opaque foil surfaces in case you don't *want* the whole universe for a backdrop. Next largest was the informal structure we came to call Fibber McGee's Closet. The Closet itself was only a long "stationary" pole studded with stanchions and line-dispensing reels, but it was always covered with junk, tethered to it for safekeeping. Props, pieces of sets, camera units and

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spare parts, lighting paraphernalia, control consoles and auxiliary systems, canisters and cans and boxes and slabs and bundles and clusters and loops and coils and assorted disorderly packages of whatever anyone had thought it might be handy to have for free fall dance and the taping thereof, all clung to Fibber McGee's Closet like interplanetary barnacles. The size and shape of the ungainly mass changed with use, and the individual components shifted lazily back and forth like schizophrenic seaweed at all times.

This was necessary, for it was not at all convenient to reenter and exit the living quarters frequently.

Imagine a sledgehammer. A big old roustabout's stake pounder, with a large, barrel-shaped head. Imagine a much smaller head, Coke-can size, at the butt end of the handle. That's my house. That's where I live with my wife when I'm at home in space, in a three and a half room walkdown with bath. Try to balance that sledgehammer horizontally across one finger. You'll want to lay that finger right up near the *other* end, just short of the much massier hammerhead. That's the point around which my house pivots, and the countermass pivots, in chasing concentric circles, to provide a net effect of one-sixth gee at home. The countermass includes life support equipment and supplies, power supply, medical telemetry, home computer, and phone hardware, and some damn big gyros. The "hammer handle" is quite long: it takes a shaft of about 135 meters to give one-sixth gee at a rotation rate of one minute. That slow a rate makes the Coriolis differential minimal, as imperceptible as it is on a torus the size of Skyfac's Ring One but without a torus's vast cubic and inherently inefficient layout. (Skyfac axiom: anywhere you want to go will turn out to be all the way round the bend; as, in short order, will you.)

Since only a Tokugawa can afford the energies required to start and stop spinning masses in space on a whim, there are only two ways to leave the house. The axis of spin aims toward Fibber McGee's Closet and Town Hall (about which more later); one can merely go out the "down" airlock ("the back door") and let go at the proper time. If you're not an experienced enough spacehand, or if you're going somewhere on a tangent to the axis of rotation, you go out the "up" lock or front door, climb up the runged hammer handle to the no-weight point and step off, then jet to where you want to go. You *always* come home by the front door; that's why it's a walkdown. The plumbing is simplicity itself, and habitual attention must be paid to keep the Closet and Hall from being peppered with freeze-dried dung.

(No, we don't save it to grow food on, or any such ecological wizardry. A closed system the size of ours would be too small to be efficient. Oh, we reclaim most of the moisture, but we give the rest to space, and buy our food and air and water from Luna like everybody else. In a pinch we could haul 'em up from Terra.)

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We went through all these hoops, obviously, to provide a sixth-gee home environment. After you've been in space for long enough, you find zero gee much more comfortable and convenient. Any gravity at all seems like an arbitrary bias, a censorship of motion—like a pulp writer being required to write only happy endings, or a musician being restricted to a single meter.

But we spent as much time at home as we could manage. Any gravity at all will slow your body's mindless attempt to adapt irrevocably to zero gee, and a sixth-gee is a reasonable compromise. Since it is local normal for both Lunar surface and Skyfac, the physiological parameters are standard knowledge. The more time we spent at home, the longer we could stay up—and our schedule was fixed. None of us wanted to be marooned in space. That's how we thought of it in those days.

If we slipped, if physicals showed one of us adapting too rapidly, we could compensate to some degree. You go out the back door, climb into the exercise yoke dangling from the power winch and strap yourself in. It looks a little like one of those Jolly Jumpers for infants, or a modified bosun's chair. You ease off the brake, and the yoke begins to "descend," on a line with the hammer handle since there's no atmospheric friction to drag you to one side. You lower away, effectively increasing the length of your hammer handle and thus your gee force. When you're "down" far enough, say at a half-gee (about 400 meters of line), you set the brake and exercise on the yoke, which is designed to provide a whole-body workout. You can even, if you want, use the built-in bicycle pedals to pedal yourself back up the line, with a built-in "parking brake" effect so that if it gets too much for you and you lose a stroke, you don't break your legs and go sliding down to the end of your tether. From low enough gee zones you can even hand-over-hand your way up, with safety line firmly snubbed—but below half-gee level you do not unstrap from the yoke for *any* reason. Imagine hanging by your hands at, say, one gravity over all infinity, wearing a snug plastic bag with three hours' air.

We all got pretty conscientious about . . . er . . . watching our weight.

The big temptation was Town Hall, a sphere slightly smaller than the Goldfish Bowl. It was essentially our communal living room, the place where we could all hang out together and chew the fat in person. Play cards, teach each other songs, argue choreography, quarrel choreography (two different things), play 3-D handball, or just appreciate the luxury of free fall without a p-suit or a job to do. If a couple happened to find themselves alone in Town Hall, and were so inclined, they could switch off half the external navigation lights—signifying "Do Not Disturb"—and make love in free fall.

(One-sixth gee sex is nice, too—but

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zero gee is *different*. Nobody's on top. It's a wholehearted cooperative effort or it just doesn't happen. [I can't imagine a free fall rape.] You get to use *both* hands, instead of just the one you're not lying on. And while a good half of the Kama Sutra goes right out the airlock, there are compensations. End of second inevitable digression.)

For one reason and another, then, it was tempting to hang out overlong at Town Hall—and so many standard daily chores *must* be done there that the temptation had to be sharply curbed. Extensive physiological readouts on all of us were sent twice daily to Doc Panzarella's medical computer aboard Skyfac: as with air, food and water, I was prepared to deal elsewhere if Skyfac ever lost its smile, but while I could have them I wanted Panzarella's brains. He was to space medicine what Harry was to space construction, and he kept us firmly in line, blistering us by radio when we goofed, handing out exercise sessions on the Jolly Jumper like a tough priest assigning novenas for penance.

We originally intended to build five sledgehammers, for a maximum comfortable population of fifteen. But we had rushed Harry, that first year: when the first group of students got off the elevator, it was a miracle that three units were completed. We had to dismiss Harry's crew early with thanks and a bonus. Ten students, Norrey, Raoul, Harry, and me totals fourteen bodies. Three units totals nine rooms. It was a hell of a courtship . . . but Norrey and I came out of it *married*; the ceremony was only a formality.

By the second season we had completed one more three-room home, and we took up only seven new students, and everybody had a door they could close and crouch behind when they needed to, and all seven of them washed out. The fifth hammer never got built.

It was that run of bad cards I mentioned earlier, extending itself through our second season.

Look, I was just beginning to become a name in dance, and rather young for it, when the burglar's bullet smashed my hip-joint. It's been a long time, but I remember myself as having been pretty damn good. I'll never be that good again, even with the use of my leg back. A few of the people we washed out were better dancers than I *used* to be—in dirtside terms. I had believed that a really good dancer almost automatically had the necessary ingredients to learn to think spherically.

The first season's dismal results had shown me my error, and so for the second semester we used different criteria. We tried to select for freethinking minds, unconventional minds, minds unchained by preconception and consistency. The results were ghastly. In the first place, it turns out that people who can question even their most basic assumptions intellectually can not necessarily do so physically—they could imagine what needed doing, but couldn't do it. Worse, the freethinkers could not co-

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operate with other freethinkers, could not work with *anyone's* preconception consistently. What we wanted was a choreographer's commune, and what we got was the classic commune where no one wanted to do the dishes. One chap would have made a terrific solo artist—when I let him go, I recommended to the Betamax people that they finance him to a studio of his own—but we couldn't work with him.

And two of the damned idiots killed themselves through thoughtlessness.

They were all *well* coached in free fall survival, endlessly drilled in the basic rules of space life. We used a double-buddy system with every student who went EVA until they had demonstrated competence, and we took every precaution I could or can think of. But Inge Sjoberg could not be bothered to spend a whole hour a day inspecting and maintaining her p-suit. She managed to miss all six classic signs of incipient coolant failure, and one sunrise she boiled. And nothing could induce Alexi Nikolski to cut off his huge mane of brown hair. Against all advice he insisted on tying it back in a kind of doubled up pony tail, "as he had always done." The arrangement depended on a *single hairband*. Sure as hell it failed in the middle of a class, and quite naturally he gasped. We were minutes away from pressure; he would surely have drowned in his own hair. But as Harry and I were towing him to Town Hall he unzipped his p-suit to deal with the problem.

Both times we were forced to store the bodies in the Closet for a gruesomely long time, while next of kin debated whether to have the remains shipped to the nearest spaceport or go through the legal complication of arranging for burial in space. Macabre humor saved our sanity (Raoul took to calling it Travis McGee's Closet), but it soured the season.

And it wasn't much more fun to say good-bye to the first of the live ones. On the day that Yeng and DuBois left, I nearly bottomed out. I saw them off personally, and the "coitus with a condom" imagery of shaking hands with p-suits on was just too ironically appropriate. The whole semester, like the first, had been coitus with a condom—hard work, no product—and I returned to Town Hall in the blackest depression I had known since . . . since Shara died. By association, my leg hurt; I wanted to bark at someone. But as I came in through the airlock Norrey, Harry, and Linda were watching Raoul make magic.

He was not aware of them, of anything external, and Norrey held up a warning hand without meeting my eyes. I put my temper on hold and my back against the wall beside the airlock; the velcro pad between my shoulderblades held me securely. (The whole sphere is carpeted in "female" velcro; pads of "male" are sewn into our slippers—which also have "thumbs"—our seats, thighs, backs, and the backs of our gloves. Velcro is the cheapest furniture there is.)

Raoul was making magic with com-

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mon household ingredients. His most esoteric tool was what he referred to as his "hyperdermic needle." It looked like a doctor's hypo with elephantiasis: the chamber and plunger were oversized, but the spike itself was standard size. In his hands it was his magic wand.

Tethered to his skinny waist were all the rest of the ingredients: five drinking bulbs, each holding a different colored liquid. At once I identified a source of subconscious unease, and relaxed: I had been missing the vibration of the air conditioner, missing the draft. Twin radial tethers held Raoul at the center of the sphere, in the slight crouch typical of free fall, and he *wanted* still air—even though it severely limited his working time. (Shortly, exhaled carbon dioxide would form a sphere around his head; he would spin gently around his tethers and the sphere would become a donut; by then he must be finished. Or duck inside the donut. I would have to be careful to keep moving myself, spiderlike, as would the others.)

He speared one of the bulbs with his syringe, drew off a measured amount. Apple juice, by the color of it, admixed with water. He emptied the syringe gently, thin knuckly fingers working with great delicacy, forming a translucent golden ball that hung motionless before him, perfectly spherical. He pulled the syringe free, and the ball . . . shimmered . . . in spherically symmetrical waves that took a long time to ebb.

He filled his syringe with air, jabbed it into the heart of the ball and squeezed. The bulb filled with a measured amount of air, expanding into a nearly transparent golden bubble, around which iridescent patterns chased each other in lazy swirls. It was about a meter in diameter. Again Raoul disengaged the syringe.

Filling it in turn from bulbs of grape juice, tomato juice and unset lime Jell-O, he filled the interior of the golden bubble with spherical beads of purple, red and green, pumping them into bubbles as he formed them. They shone, glistened, jostling but declining to absorb each other. Presently the golden bubble was filled with Christmas tree balls in various sizes from grape to grapefruit, shimmering, borrowing colors from each other. Marangoni Flow, gradients in surface tension, made them spin and tumble around each other like struggling kittens. Occasional bubbles were pure water, and these were rainbow scintillations that the eye ached to fragment and follow individually.

Raoul was drifting for air now, holding the macrobubble in tow with the palm of his hand, to which the whole thing adhered happily. If he were to strike it sharply now, I knew, the whole cluster would *snap* at once into a single, larger bubble around the surface of which streaks of colors would run like tears (again, by Marangoni Flow). I thought that was his intention.

The master lighting panel was velcro'd to his chest. He dialed for six tight spots, focusing them on the bub-

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blejewel with sure fingers. Other lights dimmed, winked out. The room was spangled with colors and with color, as the facets of the man-made jewel flung light in all directions. With a seemingly careless wave of his hand, Raoul set the scintillating globe spinning, and Town Hall swam in its eerie rainbow fire.

Drifting before the thing, Raoul set his Musicmaster for external speaker mode, velcro'd it to his thighs and began to play.

Long, sustained warm tones first. The globe thrilled to them, responding to their vibrations, expressing the music visually. Then liquid trills in a higher register, with pseudowoodwind chords sustained by memory-loop beneath. The globe seemed to ripple, to pulse with energy. A simple melody emerged, mutated, returned, mutated again. The globe spangled in perfect counterpoint. The tone of the melody changed as it played, from brass to violin to organ to frankly electronic and back again, and the globe reflected each change with exquisite subtlety. A bass line appeared. Horns. I kicked myself free of the wall, both to escape my own exhalations and to get a different perspective on the jewel. The others were doing likewise, drifting gently, trying to become organic with Raoul's art. Spontaneously we danced, tossed by the music like the glistening jewel, by the riot of color it flung around the spherical room. An orchestra was strapped to Raoul's thighs now, and it made us free fall puppets.

Improv only; not up to concert standard. Simple group exercises, luxuriating in the sheer physical *comfort* of free fall and sharing that awareness. Singing around the campfire, if you will, trying out unfamiliar harmonies on each other's favorite songs. Only Harry abstained, drifting somehow "to one side" with the odd, incongruous grace of a polar bear in the water. He became thereby a kind of second focus of the dance, became the camera eye toward which Raoul aimed his creation, and we ours. Harry floated placidly, absorbing our joy and radiating it back.

Raoul tugged gently on a line, and a large expandable wire loop came to him. He adjusted it to just slightly larger than the bubblejewel, captured that in the loop and expanded the loop rapidly at once. Those who have only seen it masked by gravity have no idea how powerful a force surface tension is. The bubblejewel snapped into a concave lens about three meters in diameter, within which multicolored convex lenses bubbled, each literally perfect. He oriented it toward Harry, added three low-power lasers from the sides, and set the lens spinning like the Wheel of Kali. And we danced.

After a while the knock-knock light went on beside the airlock. That should have startled me—we don't get much company—but I paid no mind, lost in zero gee dance and in Raoul's genius, and a little in my own in hiring him. The lock cycled and opened to admit Tom McGillicuddy—which should have startled hell out of me. I'd

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had no idea he was thinking of coming up to visit, and since he hadn't been on the scheduled elevator I'd just put Yeng and DuBois on, he must have taken a *very* expensive special charter to get here. Which implied disaster.

But I was in a warm fog, lost in the dance, perhaps a little hypnotized by the sparkling of Raoul's grape juice, tomato juice and lime Jell-O kaleidoscope. I may not even have nodded hello to Tom, and I know I was not even remotely surprised by what he did, then.

He joined us.

With no hesitation, casting away the velcro slippers he'd brought from the airlock's dressing chamber, he stepped off into thick air and joined us within the sphere, using Raoul's guy wires to position himself so that our triangle pattern became a square. And then he danced with us, picking up our patterns and the rhythm of the music.

He did a creditable job. He was in damned good shape for someone who'd been doing all our paperwork—but infinitely more important (for terrestrial physical fitness is so *useless* in space), he was clearly functioning without a local vertical, and enjoying it.

Now I *was* startled, to my bones, but I kept pokerfaced and continued dancing, trying not to let Tom catch me watching. Across the sphere, Norrey did likewise—and Linda, above, seemed genuinely oblivious.

Startled? I was flabbergasted. The single factor that had washed out sixteen students out of seventeen was the same thing that washed out Skyfac construction men, the same thing that had troubled eight of the nine Skylab crewmen back when the first experiments with zero gee life had been made: inability to live without a local vertical.

If you bring a goldfish into orbit (the Skylab crew did), it will flounder helplessly in its globe of water. Show the fish an *apparent* point of reference, place a flat surface against its water-sphere (which will then form a perfect hemisphere thereon quite naturally), and the fish will decide that the plane surface is a stream bed, aligning its body perpendicularly. Remove the plate, or add a second plate (no local vertical or too many) and the goldfish will soon die, mortally confused. Skylab was purposely built to have three *different* local verticals in its three major modules, and eight out of nine crewmen faithfully and chronically adjusted to a module's local vertical as they entered it, without conscious thought. Traveling all the way through all three in one jaunt gave them headaches; they hated the docking adapter which was designed to have no local vertical at all. It is physically impossible to get dizzy in zero gee—your semicirculars fill up *entirely* and shut down—but they said they *felt* dizzy, any time they were prevented from coming into focus with a defined "floor" and "walls."

All of them except one. Gibson, I believe his name was, took to the docking adapter—to life without up

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and down—like a duck to water. He was the only one of nine who made the psychological breakthrough. *Now* I knew how lucky I had been that Norrey and Raoul had turned out to both be Stardancer material. And how few others ever could be.

But Tom was unquestionably one of them. One of us. His technique was raw as hell, he thought his hands were shovels and his spine was all wrong, but he was trainable. And he had that rare, indefinable *something* that it takes to maintain equilibrium in an environment that forbids equilibration. He was at home in space.

I should have remembered. He had been ever since I'd known him. It seemed to me in that moment that I perceived all at once the totality of my bloody blind stupidity—but I was wrong.

The impromptu jam session wound down eventually; Raoul's music frivolously segued into the closing bars of *Thus Spake Zarathustra*, and as that last chord sustained, he stabbed a rigid hand through his lens, shattering it into a million rainbow drops that dispersed with the eerie grace of an expanding universe.

"Hoover that up," I said automatically, breaking the spell, and Harry hastened to kick on the air scavenger before Town Hall became sticky with fruit juice and Jell-O. Everyone sighed with it, and Raoul the magician was once again a rabbity little guy with a comic-opera hypo and a hula-hoop. And a big wide smile. The tribute of sighs was followed by a tribute of silence; the warm glow was a while in fading. *I'll be damned,* I thought, *I haven't made memories this good in twenty years.* Then I put my mind back in gear.

"Conference," I said briefly, and jaunted to Raoul. Harry, Norrey, Linda, and Tom met me there, and we grabbed hands and feet at random to form a human snowflake in the center of the sphere. This left our faces every-which-way to each other, of course, but we ignored it, the way a veteran DJ ignores the spinning of a record-label he's reading. Even Tom paid no visible mind to it. We got right down to business.

"Well Tom," Norrey said first, "what's the emergency?"

"Is Skyfac bailing out?" Raoul asked.

"Why didn't you call first?" I added. Only Linda and Harry were silent.

"Whoa," Tom said. "No emergency. None at all, everybody relax. Businesswise everything continues to work like a ridiculously overdesigned watch."

"Then why spring for the chartered elevator? Or were you stowing away in the regular that just left?"

"No, I had a charter, all right—but it was a taxi. I've been in free fall almost as long as you have. Over at Skyfac."

"Over at—" I thought things through, with difficulty. "And you went to the trouble of having your calls and mail relayed so we wouldn't catch on."

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"That's right. I've spent the last three months working out of our branch office aboard Skyfac." That branch office was a postal address somewhere in the lower left quadrant of Tokugawa's new executive secretary's desk.

"Uh huh," I said. *"Why?"*

He looked at Linda, whose left ankle he happened to be holding, and chose his words. "Remember that first week after we met, Linda?" She nodded. "I don't think I've been so exasperated before in my whole life. I thought you were the jackass of the world. That night I blew up at you in Le Maintenant, that last time that we argued religion—remember? I walked out of there that night and took a copter straight to Nova Scotia to that damned commune you grew up in. Landed in the middle of the garden at three in the morning, woke half of 'em up. I raved and swore at them for over an hour, *demanding* to know how in the hell they could have raised you to be such a misguided idiot. When I was done they blinked and scratched and yawned and then the big one with the really improbable beard said, 'Well, if there's that much juice between you, we would recommend that you probably ought to start courting,' and gave me a sleeping bag."

The snowflake broke up as Linda kicked free, and we all grabbed whatever was handiest or drifted. Tom reversed his attitude with practiced ease so that he tracked Linda, and continued to speak directly to her.

"I stayed there for a week or so," he went on steadily, "and then I went to New York and signed up for dance classes. I studied dance when I was a kid, as part of karate discipline; it came back, and I worked hard. But I wasn't sure it had anything to do with zero gee dance—so I sneaked up to Skyfac without telling any of you, and I've been working like hell over there ever since, in a factory sphere I rented with my own money."

"Who's minding the store?" I asked mildly.

"The best trained seals money can buy," he said shortly. "Our affairs haven't suffered. But I have. I hadn't intended to tell you *any* of this for another year or so. But I was in Panzarella's office when the Termination of Monitoring notices came in on Yeng and DuBois. I knew you were hurting for bodies. I'm self-taught and clumsy as a pig on ice and on Earth it'd take me another five years to become a fourth-rate dancer, but I think I can do the kind of stuff you're doing here."

He wriggled to face me and Norrey. "I'd like to study under you. I'll pay my own tuition. I'd like to work with you people, besides just on paper, and be part of your company. I think I can make a Stardancer." He turned back to Linda. "And I'd like to start courting you, by your customs."

Then it was that the totality of my stupidity truly did become apparent to me. I was speechless. It was Norrey who said, "We accept," on behalf of the company, at the same instant that Linda said the same thing for herself.

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And the snowflake reformed, much smaller in diameter.

Our company was formed.

As to the nature of our dance itself, there is not much to be said that the tapes themselves don't already say. We borrowed a lot of vocabulary from New Pilobolus and the Contact Improv movement (which had been among the last spasms of inventiveness before that decade-long stasis in dance I mentioned earlier), but we had to radically adapt almost everything we borrowed. Although the Contact Improv people say they're into "free fall," this is a semantic confusion: *they* mean "falling freely"; *we* mean "free of falling." But a lot of their discoveries *do* work, at least in some fashion, in zero gee—and we used what worked.

Linda's own dance background included four years with the New Pilobolus company: if you don't know them, or the legendary Pilobolus company they sprang from, they're sort of Contact Improv without the improv, carefully choreographed stuff. But they too are into "using each other as the set"—dancing on, over and around one another, cooperating in changing *each other's* vectors. Dancing acrobats, if you will. We ourselves tried to achieve a balanced blend of both prechoreographed and spontaneous dance in the stuff we taped.

Linda was able to teach us a lot about mutually interreacting masses, hyperfulcrums and the like—and a lot more about the *attitude* they require. To truly interact with another dancer, to spontaneously create shapes together, you must attempt to attune yourself to them empathically. You must know them—how they dance and how they're feeling at the moment—to be able to sense what their next move will be, or how they will likely react to yours. When it works, it's the most exhilarating feeling that I've ever known.

It's *much* harder with more than one partner, but the exhilaration increases exponentially.

Because free fall requires mutual cooperation, mutual awareness on a spherical level, our dance began to become an essentially spiritual exercise.

And so, with a company of adequate size and an increasing grasp of what zero gee dance was really about, we began our second and last season of taping.

CHAPTER FOUR

I fell through starry space, balanced like an inbound comet on a tail of fluorescent gas, concentrating on keeping my spine straight and my knees and ankles locked. It helped me forget how nervous I was.

"Five," Raoul chanted steadily, "four, three, two, *now*," and a ring of his bright orange "flame" flared soundlessly all around me. I threaded it like a needle.

"Beautiful," Norrey whispered in my ear, from her vantage point a kilometer away. At once I lifted my arms straight over my head and bit down

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hard on a contact. As I passed through the ring of orange "flame," my "tail" turned a rich, deep purple, expanding lazily and symmetrically behind me. Within the purple wake, tiny novae sparkled and died at irregular intervals: Raoul magic. Just before the dye canisters on my calves emptied, I fired by belly thruster and let it warp me "upward" in an ever-increasing curve while I counted seconds.

"Light it up, Harry," I said sharply. "I can't see you." The red lights winked into being *above* my imaginary horizon and I relaxed, cutting the ventral thrust in plenty of time. I was not heading precisely for the camera, but the necessary corrections were minor and would not visibly spoil the curve. Orienting myself by a method I can only call informed writhing, I cut main drive and selected my point.

On Earth you can spin forever without getting dizzy if you select a point and keep your eyes locked on it, whipping your head around at the last possible second for each rotation. In space the technique is unnecessary: once out of a gravity well, your semicirculars fill up and your whole balance system shuts down; you *can't* get dizzy. But old habit dies hard. Once I had my point star I tumbled, and when I had counted ten rotations the camera was close enough to see and coming up fast. At once I came out of my spin, oriented, and braked *sharply*—maybe three gees—with all thrusters. I had cut it fine: I came to rest relative to the camera barely fifty meters away. I cut all power instantly, went from the natural contraction of high acceleration to full release, giving it everything I had left, held it for a five-count and whispered, "Cut!"

The red lights winked out, and Norrey, Raoul, Tom, and Linda cheered softly (nobody does anything loudly in a p-suit).

"Okay, Harry, let's see the playback."

"Coming up, boss."

There was a pause while he rewound, and then a large square section of distant space lit up around the edges. The stars within it rearranged themselves and took on motion. My image came into frame, went through the maneuver I had just finished. I was pleased. I had hit the ring of orange "flame" dead center and triggered the purple smoke at just the right instant. The peelout curve was a little ragged, but it would do. The sudden growth of my oncoming image was so startling that I actually flinched—which is pretty silly. The deceleration was nearly as breathtaking to watch as it had been to do, the pullout was fine, and the final triumphant extension was frankly terrific.

"That's a take," I said contentedly. "Which way's the bar?"

"Just up the street," Raoul answered. "I'm buying."

"Always a pleasure to meet a patron of the arts. How much did you say your name was?"

Harry's massive construction man's spacesuit, festooned with tools, appeared from behind and "beneath" the camera. "Hey," he said, "not yet.

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Gotta at least run through the second scene."

"Oh hell," I protested. "My air's low, my belly's empty, and I'm swimming around in this overgrown galosh."

"Deadline's coming," was all Harry said.

I wanted a shower so bad I could taste it. Dancers are all different; the only thing we *all* have in common is that we all sweat—and in a p-suit there's nowhere for it to go. "My thrusters're shot," I said weakly.

"You don't need 'em much for Scene Two," Norrey reminded me. "Monkey Bars, remember? Brute muscle stuff." She paused. "And we are pushing deadline, Charlie."

Dammit, a voice on earphones seems to come from the same place that the voice of your conscience does.

"They're right, Charlie," Raoul said. "I spoke too soon. Come on, the night is young."

I stared around me at an immense sphere of starry emptiness, Earth a beachball to my left, and the Sun a brilliant softball beyond it. "Night don't *come* any older than this," I grumbled, and gave in. "Okay, I guess you're right. Harry, you and Raoul strike that set and get the next one in place, okay? The rest of you got your blocking?"

Norrey, Tom, and Linda all said they did, and so while Raoul and Harry took the family car out to vacuum up the vacuum, I sat on nothing and brooded about the damned deadline. It *was* getting time to go dirtside again, which meant it was time to get this segment rehearsed and shot, but I didn't have to like it. No artist likes time pressure, even those who can't produce without it. So I brooded.

The show must go on. The show must always go on, and if you are one of those millions who has always wondered exactly why, I will tell you. The tickets have already been sold.

But it's uniquely hard (as well as foolish) to brood in space. You hang suspended within the Big Deep, infinity in all directions, an emptiness so immense that although you know that you're falling through it at high speed, you make not the slightest visible progress. Space is God's throne room, and so vasty a hall is it that no human problem has significance within it for long.

Have you ever lived by the sea? If so, you know how difficult it is to retain a griping mood while contemplating the ocean.

Space is like that, only more so.

Much more so.

By the time the Monkey Bars were assembled, I was nearly in a dancing mood again. The Bars were a kind of three-dimensional gymnast's jungle, a huge partial icosahedron composed of transparent tubes inside which neon fluoresced green and red. It enclosed an area of about 14,000 cubic meters, within which were scattered a great many tiny liquid droplets that hung like motionless dust motes, gleaming in laserlight. Apple juice.

When Raoul had first showed me

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the model for the Monkey Bars, I had been struck by their aesthetic beauty. By now, however, after endless simulations and individual rehearsals, I saw them only as a complex collection of fulcrums and pivots for Tom, Linda, Norrey, and me to dance on, an array of vector-changers designed for maximal movement with minimal thruster use. Scene Two relied almost entirely on muscle power, a paradox considering the technology implicit in its creation. We would pivot with all four limbs on the Bars and on each other, borrowing some moves from the vocabulary of trapeze acrobatics and some from our own growing experience with free fall lovemaking, constantly forming and dissolving strange geometries that were new even to dance. (We were using prechoreography rather than improv techniques: the Bars and their concept were too big for the Goldfish Bowl, and you can't afford mistakes in free space.)

Though I had taught individual dancers their parts and rehearsed some of the trickier clinches with the group, this would be our first full runthrough together. I found I was anxious to assure myself that it would actually work. All the computer simulation in the world is no substitute for actually doing it: things that look lovely in compsim can dislocate shoulders in practice.

I was about to call places when Norrey left her position and jetted my way. Of course there's only one possible reason for that, so I turned off my radio too and waited. She decelerated neatly, came to rest beside me, and touched her hood to mine.

"Charlie, I didn't mean to crowd you. We can come back in eleven hours and —"

"No, that's okay, hon," I assured her. "You're right: 'deadline don't care.' I just hope the choreography's right."

"It's just the first runthrough. And the simulations were great."

"That's not what I mean. Hell, I know it's *correct*. By this point I can think spherically just fine. I just don't know if it's *any good*."

"How do you mean?"

"It's exactly the kind of choreography Shara would have loathed. Rigid, precisely timed, like a set of tracks."

She locked a leg around my waist to

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arrest a slight drift and looked thoughtfully. "She'd have loathed it for herself," she said finally, "but I think she'd really have enjoyed watching us do it. It's a *good* piece, Charlie—and you know how the critics love anything abstract."

"Yeah, you're right—again," I said, and put on my best Cheerful Charlie grin. It's not fair to have a bummer at curtain time: it brings the other dancers down. "In fact, you may have just given me a better title for this whole mess: *Synapstract*."

There was relief in her answering grin. "If it's got to be a pun, I like *ImMerced* better."

"Yeah, it does have a kind of Cunningham flavor to it. Bet the old boy takes the next elevator up after he sees it." I squeezed her arm through the p-suit, added "Thanks, hon," and cut in my radio again. "All right, boys and girls, *'let's shoot this turkey.'* Watch out for leg-breakers and widowmakers. Harry, those cameras locked in?"

"Program running," he announced. " 'Blow a gasket'. It's the Stardancer's equivalent of 'Break a leg.'"

Norrey scooted back into position, I corrected my own, the lights came up hellbright on cameras 2 and 4, and we took our stage, while on all sides of us an enormous universe went about its business.

You can't fake cheerfulness well enough to fool a wife like Norrey without there being something real to it; and like I said, it's hard to brood in space. It really was exhilarating to hurl my body around within the red and green Bars, interacting with the energy of three other dancers I happened to love, concentrating on split second timing and perfect body placement. But an artist is capable of self-criticism even in the midst of the most involving performance. It's the same perpetual self-scrutiny that makes so many of us so hard to get along with for any length of time—and that makes us artists in the first place. The last words Shara Drummond ever said to me were, "Do it right."

And even in the whirling midst of a piece that demanded all my attention, there was still room for a little whispering voice that said that this was only the best I had been able to do and still meet my deadline.

I tried to comfort myself with the notion that every artist who ever worked feels exactly the same way, about nearly every piece they ever do—and it didn't help me any more than it ever does any of us. And so I made the one small error of placement, and tried to correct with thrusters in too much of a hurry and triggered the wrong one and smacked backward hard into Tom. His back was to me as well, and our air tanks *clanged* and one of mine blew. A horse kicked me between the shoulder blades and the Bars came up fast and caught me across the thighs, tumbling me end over end. I was more than twenty meters from the set, heading for forever, before I had time to black out. ■

TO BE CONTINUED

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skyquakes, earthlights, and e.m. fields●●●●●

UFOs are "alive" and well and predicting earthquakes!
JOSEPH F. GOODAVAGE

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The earth speaks softly to the mountain
Which trembles
And lights the sky
ancient Japanese haiku

Reports of atmospheric luminosity, "balls of fire," sheet lightning, and other eerie floods of light in the sky before, during and after earthquakes, have befuddled seismologists for decades. There have been so many similar reports from accredited scientists recently that the U.S. Geological Survey in Denver began an intensive study of this mysterious facet of nature. Dr. John S. Derr, a geophysicist and earthquake expert who heads the investigation, reported that earthquake lights or flares have been observed and reliably reported for untold years.

A Dykko Medical College physics professor in earthquake prone Japan collected photographs of lights seen near Matisushiro in the late 1960s. He also reported on Santa Rosa's 1969 earthquake lights that were seen and described by thousands of people as being similar to meteors, electric sparks, fireballs, and sheet lightning. About forty years ago during earth tremors the sky was lit up before, during and after the quake, and resembled auroral streamers, beams and columns of light, and fireballs that could be seen from a distance of seventy miles.

The most devastating (in terms of hundreds of thousands of human lives lost) earthquake of 1976 was the massive upheaval in T'angshan, China, when the entire sky lit up during the quake. It was like daylight. Still . . . it's well to remember what Seneca told the Romans more than 2200 years ago: "*The world would rather cling to a wrong idea than accept a new truth.*"

Until recently one of the most unacceptable ideas was that these strange, frequently erratic, often terrifying glowing shapes in the night skies—the appearances of showers of "meteors" and anomalous lightning (when there were no storms) directly before, during or after earthquakes have anything in common. The final explanation may be simpler, yet vastly more intriguing, partly because the low-level oscillation of the atmosphere during or preceding great seismic upheavals seems to result in the generation of extremely low frequency (ELF) electromagnetic fields that (a) not only cause electrical luminosity of the atmosphere, but (b) also directly influence the brain by being in almost perfect synchronization with human brain wave activity.

We are, after all, electrochemical entities. Even so, when the most sensitive instruments are placed only a few inches from the brain during encephalographic measurements, they cannot detect the presence of brain waves. According to Dr. Michael A. Persinger of Laurentian University's Psychophysiology Laboratory in Canada, the propagation of psi phenomena across distances of hundreds or even thousands of miles, would require *trillions* of times more energy than the

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human brain is able to produce.

There must therefore, be an alternate solution. Dr. Persinger, who is not much of a psi enthusiast, was nevertheless intrigued by the great number of people who somehow "knew" or felt that an earthquake was imminent *and accurately predicted it.* He wanted to know the mechanism underlying these apparent demonstrations of psychic ability.

"The energy required for those paranormal cases which do not primarily involve peculiarities in brain chemistry," he reported in *Geophysical Models for Parapsychological Experience* (Psychoenergetic Systems, 1975, Vol. 1, pp. 63-74), "does not originate in the organism, but within *the environment* in which the organism is exposed."

The wrong approach is to theorize about physical methods of generating telepathy and other psi phenomena, Persinger believes. He rejects the idea that the energy source of paranormal events originates within the organism and that something *leaves* one organism (the putative agent) to influence a second organism (the putative percipient), as unrealistic.

"It is highly unlikely that sufficient amounts of stimulus energy could originate and be generated from the body/brain to any significant effectual distance. Physically speaking, the amounts of energy within the brain/body are much too minute. Most of the energy emitted . . . occurs in the infrared bands as a consequence of glycolysis. As for psychics who successfully predict great oncoming disasters such as tornadoes, hurricanes, earthquakes and devastating thunderstorms . . . *Such paranormal phenomena utilize the energy already available in the physical environment.*"

It may be more than mere coincidence then, that the human brainwave cycle (eight per second) is in almost perfect synchronization with the propagation of radio, light, and all known electromagnetic radiation which flashes completely around the planet exactly eight times in one second.

The fireballs, spherical and cigar-shaped lights and "objects," the baffling atmospheric luminosities seen before, during and after earthquakes, cyclones, and even volcanic eruptions, have also been detected (from great distances) during severe electrical storms. The current theory is that violent low-level air oscillation, "caused in some unknown manner by earthquakes and storms, causes electrical luminosity in the atmosphere."

The mystery lies in the fact that the same kind of lights also appear when there is no earthquake, volcanic eruption or electrical storm within thousands of miles. Moreover, the same phenomena have been reliably reported by scores of commercial and military planes.

A Mexican seismologist, Dr. Cinna Lomnitz, happened to be in China in July, 1976, when the T'angshan quake struck. "The sky was lit up like daylight," he said, "bright enough to wake people up, thinking their room

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lights had been turned on."

How is such power generated; more important, how is it transmitted for such great distances into the atmosphere and even around the curvature of the Earth? And how intimately is it related to anomalous lights, radiant skies, fireballs, and other phenomena? Trying to find a rational path through such a maze is one of the most precarious tightwire walks for the physical scientist to perform because extremely low-frequency EM radiation is also known to affect human brainwave activity and, in some as-yet-unknown way, the process of thinking. At some undetermined point, according to Dr. Persinger, it almost seems to blend with paranormal experience. Under such circumstances it's virtually impossible to get an accurate measurement of the phenomenon when your physical presence either interferes with the thing you are trying to measure, *or* when the object or location to be measured interferes in any way with the transducer that does the measuring—*the brain.*

"Human thought responses and related behaviors are the final measurement devices," observes Dr. Persinger, "the terminal reference points."

Some of the nocturnal lights seen in the sky persist in one specific geographic location—sometimes for centuries. They seem to change size, color and number. Moreover, they "elude" enthusiastic pursuers by maneuvering or simply disappearing. "They are definitely not the products of storms," claims Vincent Gaddis, who wrote a thorough report on The Palantine Light, "as ball lightning seems to be, although they of course may be atmospheric aberrations of some sort. Nocturnal lights are rarely reported in the scientific literature."

Samuel Livermore, in *A History of Block Island*, gave this description: "The light is actually seen, sometimes one-half mile from the shore, where it lights up the walls of the rooms through the windows. . . .

"The people here are so familiar with the sight they never think of giving notice to those who do not happen to be present, or even mentioning it afterwards, unless they hear some particular inquiries have been made. It beams with various magnitudes. Sometimes it is small, resembling the light through a distant window, at others expanding to the highness of a ship with all her canvas spread. The blaze actually emits luminous rays.

"The cause of this 'roving brightness' is a curious subject for philosophical speculation. Some, perhaps, will suppose it depends upon a peculiar modification of electricity; others upon the inflammation of phlogogistous (sic) gas."

Similar reports are to be found in human history going back thousands of years.

A clearer understanding of how electrical Earth currents modify the positive and negative ionization of the atmosphere is an absolute necessity before reaching unsubstantiated conclusions. By and large our democratic

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(and other) institutions are based on the completely unproven (and certainly unscientific) *faith* that man controls his own destiny through human-made political, scientific, technological, religious, and other institutions. The hard evidence however, shows that we are products of the environment—sustained, nourished, and influenced by the electromagnetic gravitational-tidal system of the Earth-Sun-Moon group.

Except for rare instances such as that of the Chinese seismologists in 1975, few people have ever reliably predicted the onset of an earthquake. And in spite of their success the previous year, the Chinese—for some unknown reason— did *not* repeat their successful forecast on July 28, 1976, when 750,000 (perhaps a million) Chinese died in T'angshan during history's third greatest earthquake catastrophe.

In all fairness however, Chinese seismologists managed to predict three of six major temblors (magnitude greater than 7 on the Richter scale), according to a Chinese report in August, 1977. This disclosure was confirmed by geophysicist Robert L. Wesson of the U.S. Geological Survey. He said that Chinese scientists reported last year's successes at a Paris meeting that had convened to plan a worldwide conference on *all* aspects of earthquake prediction, including the social as well as scientific significance of anomalous lights, erratic electrical discharges, and other phenomena.

The three quakes reported at the meeting sponsored by the U.N. Educational, Scientific, and Cultural Organization were all about magnitude 7. They struck on schedule on May 29 in Yunnan province, on August 16 in Szechuan province, and on November 7th in a Szechuan-Yunnan border region—all three confined to southern and south-central China. In each case, a medium or long-range forecast was given privately. The Chinese populace was not informed about the impending quake, but each prediction was followed by extensive planning, preparation, and public education.

(Following the social uproar a few years ago when a California seismologist sounded a false alarm about his calculated prediction of an impending quake, one of the Americans at the Paris meeting asked Ting Kuo Yu of the State Seismological Bureau in Peking whether several similar false alarms would incur the wrath of the citizenry for risking a public panic. "Oh, some people complained," the seismologist replied, "but on the whole, the Chinese people would rather respond to many false alarms than suffer the consequences of an unpredicted earthquake.")

In view of the increasing acceptance of the fact that mysterious events do coincide with quakes, the experts in seismology are convinced that the most promising theory in earthquake prediction is intimately associated with the so-called piezo-electric effect in which an electric potential is generated in certain kinds of quartz-bearing rock when it is subjected to stress,

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such as pressure. (The same principle is used in telephone receivers and microphone transmitters, in which varying pressures from sound waves cause corresponding electrical responses in the crystals.)

After a series of studies, two New York physicists, J. R. Powell and David Finkelstein, concluded that enough stress is accumulated in rocks in a fault zone over a period of years and could change in intensity several days before a large earthquake—*as well as during and after the quake.*

These stress-intensity alterations seem to be detectable by animals. Scientists who once rejected such folklore as nonsense, are now giving serious attention to reports of strange animal activity prior to earthquakes. Rats, for example, are said to have swarmed through the gutters of San Fernando the night before the great 1971 quake in California. Other reports include similar mass evacuation of rats—even of alligators scrambling out of the water and running into the woods, screaming all the while. The bizarre behavior of barnyard and domestic animals (reported in virtually every nation on Earth) indicate that our fellow creatures (and some of our fellow humans) have a kind of physical or brain receptor site that enables them to know in advance that an earthquake is about to strike: geese fly into trees, pigs bite each other, and snakes, pigs, cows, and horses make frenzied attempts to flee *from* cover when an earthquake is imminent. The linkage of erratic animal behavior with advance earthquake warnings has been accepted in the folklore of most civilized nations—especially the Far East—as thoroughly reliable for at least several thousand years.

(So when the American scientific delegation visited China in June, 1976, they were able to return with proof that the Chinese actually did predict a major quake on February 4, 1975 in northeast China at Haicheng, which was evacuated to save tens of thousands of lives. After the closed-door Paris session, American earthquake experts reported that the U.S. Geological Survey had just issued a grant for "a long-range study of pocket mice and kangaroo rats to learn whether animals can sense upcoming earthquakes."

Dr. Durward D. Skiles, a geophysicist, and Dr. Robert G. Lindberg, a biologist, both from UCLA, then set up an informal desert laboratory at the southern edge of the "Palmdale Bulge," an area of frequent small tremors that is closely and constantly studied by seismologists. "The ideal payoff, scientifically speaking," said Skiles, "would be if all the mice came above ground at high noon and refused to go back into their burrows and all the rats raced on their running wheels at the same time, followed the next day by a major earthquake."

They're now convinced that any valid predictive system must rely on a *combination* of clues, including earth tilts, foreshocks, the release of gases from well water, changes in gravity, magnetism, electrical earth currents,

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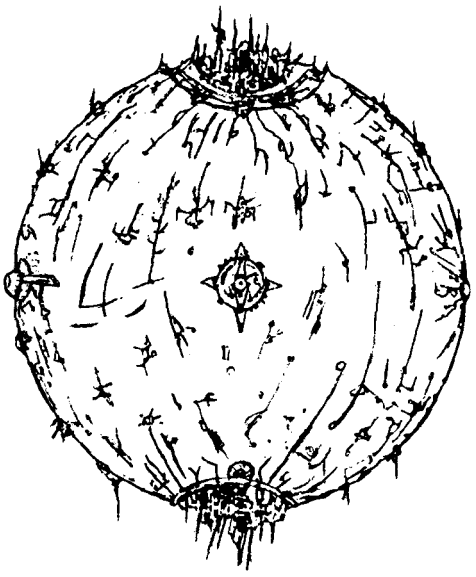
Empyrean Challenge



EMPYREAN . . . is defined as "the highest heavens". Control of a star cluster comprising 100 solar systems and 500 planets is the goal of this 250 player hidden-movement strategic science fiction game. Players are faced with over population and dwindling resources on their home planets. Each player negotiates with the other rulers of the planet in order to cope with tricky economic situations, rebellion, exploration problems, war, and new technology, and finally, to establish interstellar travel. The player finds new worlds, sets up orbiting factories, protects his colonies, and can discover whole new systems where other "races" can be encountered. EMPYREAN CHALLENGE is the most comprehensive computer-moderated futuristic play-by-mail game in existence.

There are two turns per month – they are processed every 2 to 3 weeks and print-outs with the results are mailed back to you. The cost of entering a game is $10.00 ($4.00 is for the set-up fee and rules – the balance is for the next three turns.) Game Fee is $2.00 per turn.

Name .....

Address .....

..... Enclosed is $1.00. Please rush me the rules.

..... Enclosed is $10.00. Please enter me in EMPYREAN CHALLENGE

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atmospheric glows, ground water levels, *and* anomalistic animal behavior. When they found the skeletons of three gophers buried in burrows in sediments a few feet below the surface that was offset by a quake that struck California approximately six thousand years ago, scientists from the Geological Survey of the Department of the Interior concluded late in July, 1977 that the Ventura Fault is still potentially active.

Strange lights seen in the skies over the Malagasy Republic on the island of Madagascar 500 kilometers off the coast of Mozambique on the night of July 30, 1977, left scientists in a state of stunned confusion. A "meteor" of vast size struck the Earth, producing "what must be the greatest impact crater of modern times." According to *Agence France Press*, "a terrible noise" and "a bluish light" accompanied "meteoric fireballs" seen over Madagascar's capital city, Tananarive. Reports of a 240-meter crater were received in the Soviet Union and the United States. "This would be one of the major, if not *the* major, meteorite events of this century," said Harold Provenmire, assistant director of the American Meteor Society. A great flaming or bright "object" of some kind did seem to flash through the skies over Madagascar, but no giant crater was ever found. Something enormous however, is believed to have crashed into the area. A half hour later, an earthquake struck near Fianarantsoa.

By an odd twist of events, the Tananarive Seismological Observatory was "suffering from a defective machine"—a malfunctioning seismograph—at the time of the impact. Whether they are "meteoric fireballs," spheroid airships with flashing lights, or gossamer luminosities, the mysterious glows are observed in the skies day and night and, *most important*, in areas where *no* seismic activity has been reported for months or years before (or after) the sightings. Such mysteries may indicate the working of an unspecified geophysical process to produce intense oval, spherical, and "platelike" displays of light. (Flying saucers, alien spaceships, and strange creatures reported by "contactees"—Betty and Barney Hill being the most familiar story—are regarded as apocryphal by most scientists.)

But the disturbing, unexplained similarities in the firsthand accounts of these events, especially (during the 1950s and 1960s) coming from people with no knowledge of or interest in the details of others who shared the same experiences, is puzzling.

Numerous motorists have reported being "chased" by luminous "objects" with flickering red, blue, white, and green lights. Yet the tendency of scientists to dismiss these recurring stories is very widespread.

Lightning when there is no storm—luminosities and electrical generation of atmospheric lights when there is no earthquake. Why then do the witnesses to these lights so frequently report the stalling of their automobiles, the dimming of their headlights,

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the shorting-out of their cars' ignition systems? And why the familiar "sudden disappearance" and the "instant reappearance" in the sky sometimes three to five miles away, and the "impossible" right-angle turns of the luminous "objects" traveling at speeds of more than two thousand miles an hour? (I've seen a couple do just that at Wanaque Reservoir in New Jersey.)

Reports are one thing, but the evidence also includes people known to have suffered from amnesia after the bizarre events—often until they were hypnotized to "relive" their harrowing experiences. *How do we explain the many witnesses to these phenomena who emerged from the ordeal in a state of shock, temporarily blinded, or with long-lasting physical impairments such as edema ("skin burns"), nausea, inability to sleep, nightmares, eye swelling, and severe disturbances of the endocrine system—especially impotence, thyroid, and testicular malfunction*?

ITEM: Whenever a magic buff sees a new illusion, chances are that—unless he's a seasoned veteran with a comprehensive working knowledge of how such effects are generally achieved—he's just as baffled as the wide-eyed kids in the audience. The good magician however, differs from the amateur in one important respect: Rather than working backward trying to figure out how the trick was done, the competent magician approaches the problem with this attitude: *If I wanted to achieve that particular illusion how would I go about it*?

From this point, he begins to develop his version of the trick. We can use the same approach with scientific imponderables.

Some researchers have discovered a recurrent connection between certain geographic and atmospheric locations and reports of these luminosities—almost as though the Earth at that point was electrically charged. Instead of blindly struggling to figure out how these weird "spaceships" can maneuver in the atmosphere at such blinding speeds, or how the glowing "vessels" can make physically-impossible, right-angle changes in course without inertially tearing themselves apart, squashing every living thing inside—or even slowing down—we can apply the rule of Occam's Razor (i.e., the simplest explanation is probably closest to the truth) and try a theoretical model.

Using only the known, generally accepted principles of geophysics, electromagnetism, and a basic knowledge of human behavior, Dr. Michael A. Persinger has synthesized the effects of thousands of these luminosities on the human brain (a living electromagnetic system) and inert matter.

Since the startling, widely publicized appearance of flights of luminous things in 1947, they have seemed to be physical, and to function through mechanisms so exotic and advanced that, by comparison, our fledgling space-age technology looked crude and cumbersome. These strange lights

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in the sky have been reported in virtually every language, geographic location, and historical epoch. While some ancient people regarded the glows in the sky as mystical harbingers of religious events (pillars of light; columns of clouds by day), other civilizations interpreted the luminous spheroids flashing through the atmosphere in terms of the prevailing beliefs of their culture.

In the Far East, for example, they were frequently looked upon as "dragons." Among Meso-Americans, they were interpreted as symbols of various cultural gods and demons, and in the Mideast as "signs from God." Moreover, despite our own relatively advanced science and highly developed technology, we aren't that much different from our remote ancestors. In fact, we're still trying to decide whether the increased size of the human brain during a relatively short period (compared, say, to the much longer evolutionary stages of other mammals) is a result of adaptation to a radically changing environment or due to the "commands" of the genetic structure tucked inside our brains and bodies.

According to burgeoning discipline called sociobiology, *Homo sapiens* (and all other forms of life) are simply the result of different attempts by DNA and other molecular combinations to survive. Genes, the sociobiologists claim, don't give a hoot whether they make it into the future as owls, cockroaches, baboons, or humans; their sole purpose is *survival.* And their protective vehicles, according to this almost science fictional view, are the gross, lumbering bodies of humans and other creatures which serve as robots to carry their genetic information.

In this context, the sobriquet *Unidentified Flying Objects* is simply the most convenient, easily understood concept of a civilization possessing an awareness that with bigger rocket boosters, it can reach the planets—*precisely what man is doing.* "Extraterrestrial aliens" from greatly advanced federations of worlds, consequently, *must* be able to use their own exotic vessels to reach the Earth. Unidentified lights in the sky, therefore, are accepted by an uncritical public as spaceships from other stars and/or galaxies.

This concept is reinforced by the mass media of communication and firmly embedded in our collective consciousness. Almost any experience associated with a luminous atmospheric glow therefore, is, in the mind of the observer, instantly labeled a UFO.

The implicit popular assumption is that experiences identified by the same name must also have identical origins and operate according to the same mechanisms. Since no one has ever captured a "flying saucer," taken detailed photographs of its interior (or *exterior*) returned with artifacts from a nonhuman technology following one of the reports of physical "contact with extraterrestrial aliens,"—the "logical" conclusion in the minds of millions of people is that the civiliza-

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tion(s) from which these "spaceships" originate must be infinitely superior to our own.

Such a concept is as real (and inevitable) to *our own* civilization—which is itself on the brink of large-scale exploration of other planets—as "dragons," "demons," and "gods" were to the nomadic, religious, and agricultural societies of our remote historical ancestors.

From just such a basis two Canadian scientists (Drs. Persinger and Lefreniere) collected more than 7,000 reports of strange and unusual events, including cases of UFOs, ghosts, poltergeists, examples of "psychokinesis," and other "Fortean" phenomena (i.e., the falling ice, frogs, metal, fish, meat, rocks, etc., from the sky) over a period of 160 years. When the data was classified, sorted by computer, and then analyzed, some rather conspicuous and significant designs emerged.

The scientists quickly realized that clusters of reports about these anomalous events occurred in the same places at twenty-year intervals. More important, there was a strong tendency for worldwide patterns of similar strange reports to appear during the peak periods.

"It is often forgotten or unrealized," said Dr. Persinger, "that the human species exists upon an extremely thin semistable surface beneath which mammoth reactions and forces are constantly in progress. Some of these forces are represented upon the Earth's surface, e.g., the geomagnetic field. Still other forces are maintained within the crustal-mantle matrix and become apparent only during abrupt tectonic modifications, e.g., seismic activities." Although earthquakes are basically the mechanical slippage of surface "plates," Persinger found a significant number of reports associated with electromagnetism to provide the clues needed to start solving some of the mysteries about so many of these reports.

Strange lights on the ground or in the sky before, during and after earthquakes (including "thunderless earthquake lightning") during the past few centuries were numerous enough to convince the scientists that earthquake-associated lights involved "(1) indefinite instantaneous illuminations, (2) bright flames and emanations, (3) phosphorescentlike sky or clouds, and (4) well-defined mobile luminous 'masses'."

These 'masses' or solid-seeming apparitions thoroughly intrigued Persinger and Lafreniere. The metaphors used reflected the languages and cultures that described them: "pillars of fire" over homes, "flying luminous shields," and "funnel-shaped or trumpetlike glows" were often intimately associated with earthquakes. Other descriptions: "luminous wheels," "columns of whirling fire on mountains," "chains of spheroid glows moving in the same direction," and "fleets of glowing airships."

The physical details and other accounts varied broadly. Multicolored

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balls of fire or light, for instance, appeared more than twelve hours before to several minutes after earthquakes. Many of these glowing objects seemed, to people who saw them, perfectly solid and able to maintain absolute stability in the sky or on the ground for long periods of time. When approached, many observers reported the lights "suddenly moved upwards and vanished," but not always directly or smoothly. The glowing spheroids often made right-angle turns and exhibited spectacular changes in color.

From this data the scientists conceived a model in which underground strains and the massive buildup of rock pressures (even when no earthquake followed) generated piezo-electric effects of more than 100,000 volts per meter—certainly more than enough to charge the atmosphere for great distances—*vertically as well as horizontally*.

These electrical fields (often distorted due to peculiarities of the natural "architecture" of the subsurface rocks) focused and intensified geophysical forces in certain places, with the result that otherwise mild electrical manifestations became abnormal. So much so, in fact, that some of the eyewitness accounts of the strange lights not only made it seem as though the objects were somehow "alive," but that they also seemed to the observers to possess autonomy, consciousness, and—in some cases—"intelligence."

In the popular literature, the scientists weren't too surprised to see UFOs described not only as spaceships, but also as "intelligent beings" in their own right. These sightings were usually made in areas well known to be subjected to tectonic stress, rock strain release, and usually had long histories of earth tremors. When the underground pressures reached critical stresses, intense electric fields were generated, resulting in "the formation of highly localized transient column-like electric field formations." Inside these columns, the "transient ionization of the air" usually assumed the characteristic spheroid or ellipsoid/cylindrical shape because of local geophysical (and sometimes man-made) structures such as power lines, pipe lines, and power stations.

The three-dimensional movement of the luminosity, according to their explanation, made it seem as substantial as a hologram projection of a solid object, and it would reflect the vectorial changes in three-dimensional subsurface pressures and strain release. "The position of the luminosity," according to Dr. Persinger, "could display marked mobility, from almost perfect horizontal or lateral movement to sudden alterations in altitude in either vertical directions (into the sky or into the ground)."

The areas of the continental United States most prone to seismic activity, they found, were also the sites of the greatest reports of UFO sightings. In older pre-Columbian cultures, the UFOs were often referred to as "moving moons."

When these electromagnetic manifestations moved through space they

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naturally cause an increase in EM disturbances. "Changes in or failures of radio transmission/reception, electrical appliances, lighting systems or compasses would be reported near the phenomena," according to Lafreniere and Persinger.

The direct physical effects on eyewitnesses, the doctors claim, "could be more severe." Physical encounters with the UFO (electrical field) even when the field is not strong enough to generate a visible glow, often result in weird feelings of apprehension, fear, the raising of the hair on the body and head—"piloerection, and other unusual subjective behaviors associated with electrostatic fields of high intensity. (*I will personally testify to that.*) Movement of the field toward the observer or of the human observer toward the column could induce currents sufficient to produce paralysis or unconsciousness; such experiences have been reported in the laboratory situation with direct current induction (Persinger, 1975; Beal, 1974; Herin, 1968)."

These are compelling interpretations of what happens to the human body, brain and behavior when they are exposed to these naturally-occurring seismic/stress-related electrical fields. Here is the interesting conclusion of their report:

"The stimulation of the electrically unstable portions of the brain, such as the hippocampal formation, could allow the person access to imagery of epileptic, auralike form. Such imagery would be intense and indistinguishable from 'reality.' Pre-event amnesia associated with the electric shock-induced alteration in consciousness could allow confabulation characterized by the person's beliefs and fantasies. Direct exposure to intense ionizing radiation associated with the discharge periods should be followed hours to days later by . . . 'skin burns,' eye swelling, nausea, temporary blindness, sleep difficulties, and sexual disturbances."

Interestingly, and perhaps significantly, essentially the same explanation applies to people who "think" they see ghosts, apparitions, and other paranormal phenomena.

The fruits of modern technology are taken pretty much for granted. The poorest people in rural and inner city areas, for instance, enjoy luxuries beyond the wildest dreams of the richest sultans, czars, and kings of history. Caesar's mind would have boggled at photography, telephones, and color television. A small computer or digital watch would have astounded Isaac Newton. Ghengis Khan and Atilla the Hun would have drooled over automatic weapons and helicopters.

Who knows? It may eventually turn out that UFOs, ghosts, poltergeists, time machines, and other "realistic" phenomena are just as exotic as they seem. If the glowing discs observed throughout every historical period are *not* electrical atmospheric charges generated by the grinding of rocks prior to earthquakes (as Drs. Persinger and Lafreniere's evidence implies) it creates some rather prickly questions, doesn't it? ■

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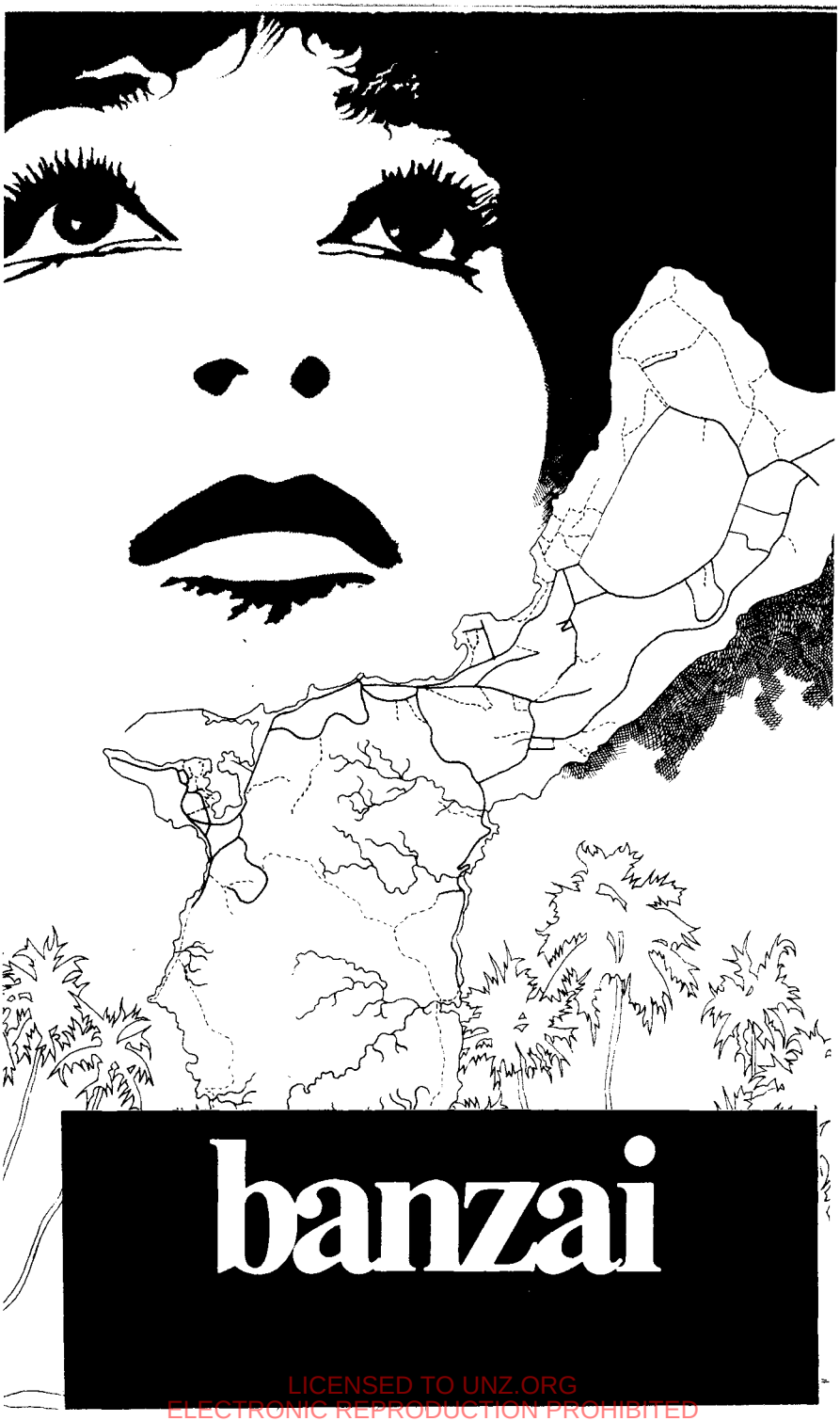

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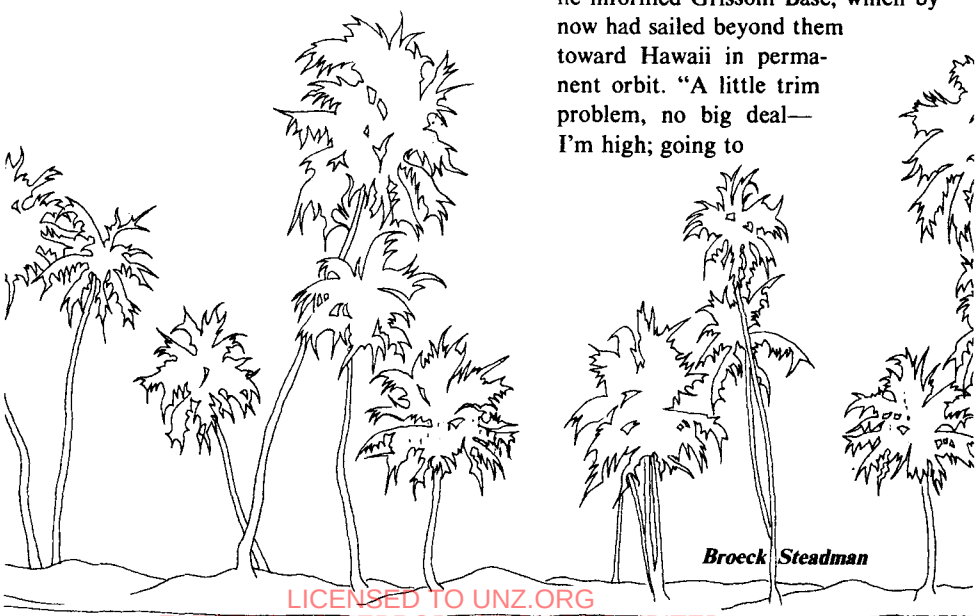
A Japanese word that means, literally, "ten thousand years!"

DEAN ING

The landing module groaned under the buffets of Earth's hostile atmosphere. Diana Moi, shrinking even smaller into her couch, saw the star-flecked black segue to familiar blue as their automatics, backed by Hauser's deft corrections, steadied the wingless aerobody high above the Philippine Sea. Another jolt, and Diana mouthed a silent *O* through her full-suit visor toward Paul Evans. Paul smiled in reassurance; he had no inkling that the nose gear hatch had already begun to curl.

Carrol Hauser knew. No warning light pinpointed the failure, but the much-modified lander's precarious trim was off and with the return module heavy on its back, Hauser suddenly had an unstable platform. He adjusted a tab actuator, held his breath, saw the visual display record a return to optimum glide path.

"Coming up on ten klicks altitude," he informed Grissom Base, which by now had sailed beyond them toward Hawaii in permanent orbit. "A little trim problem, no big deal—I'm high; going to



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run an early gear-down," he added, prescient with his flight experience. He activated the hydraulics. Three seconds later the little trim problem became a big deal.

"We have you eighty klicks west of Agana, four minutes to final bank maneuver." Grissom was still with them, Diana thought. They wouldn't let anything happen. Would they?

The main gear slid from their hatches with Siamesed precision. "Main gear lock," Hauser grunted. The nose gear, four steel-wrapped rubber doughnuts flanking their metal strut, locked a moment later. Hauser could not see the folded titanium skin slice through both starboard tires as they swung past. One layer of steel cord still held the enormous pressure in the tires. It would not be enough. "Nose gear lock," Hauser said happily. "It's looking like candy, Grissom." Diana smiled.

The big craft banked northeastward, nose arrogantly high on the only pass it could ever make, gliding down to the island of Guam. Andersen Air Force Base had a crash crew. They had all been dead for nearly a year, in common with six billion others. But pilot Hauser, medic Evans, and linguist Moi did not expect a welcoming throng. In Riga, they had heard the tapes of the last known Earthsiders, who had succumbed to plague when their air scrubbers, electrolysis, and virus filters proved inadequate like everything else, six months before in April, 1991.

Agnostic Hauser prayed the lander down, now on direct visual approach, not thinking about the past. If his feeling about this big tub was wrong, if all went well on the month-long mission, if they could erect the return module, they might have a future.

The lander touched with leviathan grace, drogue chutes billowing as the nose gear dropped toward the runway. "We have a touchdown, Grissom," Diana heard, then: "*Christ! Hang on.*"

The slashed tires both exploded on second contact, their initial spin adding velocity to hunks of rubber and steel that shrapneled into the ship. The adjacent tires, grossly overstressed, blew in separate blasts, flattening essential hydraulic lines. The naked strut plowed a deepening furrow into the runway before it folded, and Hauser saw they must cartwheel if the craft's nose caught any obstruction. He managed to cycle the main gear up before titan forces wrenched his fingers from the controls.

The entire lander spun once as a strut hesitated in retraction, the spin adding friction while it spewed pieces of ship. Pyrotechnic sensors energized the sprays that kept white-hot metal from igniting the craft as it thundered out of control, off the runway, and into a water-filled depression. The lander rocked once, settled a few meters before its belly struck bottom on the pond.

It was ten meters down to the pond but Diana and Paul Evans leaped without pause. Only after surfacing did she wonder how deep it was. Diana did not swim.

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Her suit was an encumbrance, but helped her float. As near an absolute protection as human minds could craft, its pack recycled a breathing mix before exhausting it, so the walk-around 'air' bottles were merely inconvenient. Sterile positive-flush umbilicals made it possible to ingest, excrete, and perform work in modest misery without exposure to plague. The virus did its work quickly, had killed every known anthropoid, including those on every satellite but Grissom Base. Grissom's 1,351 humans were in their last ditch; not quite self-supporting, able to mount one round-trip mission, they had chosen its elements carefully and without much ballyhoo about volunteers. There would be no rescue party.

Diana floundered onto grass, wiping water from her visor. "We can't stay here," she whimpered.

"We have to," Paul said, grasping her sleeve. "Look."

High on the lander's back, a strapping figure emerged from the cargo hatch. "Air," said Hauser's voice in her headset, as he tossed the life-sustaining cylinders into the pool.

Diana misread the fire-retardant vapors. "It's going to burn, Cal," she cried.

Cal Hauser's voice grew and dwindled as he moved through the broken ship. "If it does, we're almost certainly dead when our air runs out. Otherwise we have a month, and first things first," he finished. More cylinders splashed and bobbed in the pond.

Numb, relieved beyond belief yet fearing some small rip in her suit, Diana hurried away with air bottles and fought the urge to keep running. It was not until she was carrying food reserves that she realized they had made it down, might see another day.

But Paul, swimming to the forward cargo hatch, put limits on her relief. "May as well go after a truck," he said. Something more than exhaustion tinted his voice.

"Good heavens, there's lots more," Diana said.

"The rest is smeared all over the bulkheads, and—never mind." A prolonged sigh. Then softly, "All the rest is contaminated."

Diana turned to study the pathetic little hoard she had carried to the runway, and wondered if it would last a week.

She had never felt so pressured and useless. Inventory proved that, borrowing from the return module, they might have nine days' food, fifteen of water, sixteen of air. With unbelievable luck they might lift off in sixteen days. Very hungry. Nor did Cal's faintly sardonic conversation help much as he cut away the buckled fairing over the return module. He sensed her anxiety and chuckled. "Don't worry, Moi; we'll get you back to the big sugartit in the sky."

"Must you be vulgar?"

"Sometimes. Quit nagging and relax. Even with those sunspots blanketing the AM bands, our FM link to Grissom is fine here. If there's anything to be found, Paul and I will find

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it. Then, enter Diana Moi," he intoned, "—if milady will pardon the expression." The fairing shifted under his urging. Not enough.

"Am I the only one who's been here before?" Diana saw in her helmet readout that Cal was switching to a private, though inferior, channel. She followed suit.

"I can hear 'why me' if I listen carefully, Diana." The big man strained at a fitting. "You, because you were evacuated to Guam as a kid from Vietnam. You command oriental languages better than most—even speak the local Chamorran, a little." He grunted; she saw the fairing's edge protrude like a flaccid tongue, wondered if he hoped to splash her with filthy water. "Anyhow, frankly you had no real use on Grissom and you were altogether too goddam fastidious for some. Nobody minded risking you."

"Not since Joel died."

"Joel Marcus was a better politician than biologist, he had no business wangling a place for his lady-fair on Grissom. English is a lingua franca and you know it." He heard the stifled sob, paused. "I'm sorry he bought it, Diana. But he was thinking of his gonads and not your future."

Angrily: "We weren't—he wasn't sleeping with me." In haste, then, "I wanted to be sure."

"More fool, he. You aren't halfhomely, outside these ambulatory coffins that make us all look alike."

To change the subject from gentle dead Joel she said, "All right; I never asked, but now I know why me. But why you?"

"Because I'm a McGill anthropologist who plays politics too, in a minority party. Also, since nobody on Grissom has flown the Lockheed quiet ships, they figured an old Canadian bush-pilot like me would have the best chance. And there's supposed to be a Qship over there," he nodded across the field. "It'd be ideal for close air support when we start hunting—whatever is out there." He fell silent. Diana glanced to the serrated southern mountains and felt gooseflesh.

"Or try this one," and now Hauser was laughing easily. "I'm here because if the Guamanian Devil is real, and if we should somehow succeed, our names will be in history books a thousand years from now!"

It was far more likely that there would be no history books at all, but she could not miss the zeal that burned in his labored breathing. "You're saying you volunteered?"

"No, but my physician could have, um, faked a medical hitch."

"Paul? He wouldn't do that." Diana remembered Hauser as she had first seen him on Grissom, the great squared shoulders and muscular buttocks impressive under his coverall. A coterie of Grissom personnel had a secret label for him: *Lonranger-san.* Hauser might be growing older, but it was impossible to think of him as a medical case.

"Paul would do a lot of things," Cal snorted, "if the right man asked. He's a good mechanic, a better pathologist,

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and an embarrassment to a very old, and *very* very dear," he softly expectorated the final word, "friend."

Diana watched a coil of quartz cable arc from Cal to the grass near her. "I can't pull that fairing," she complained.

The response was carefully flat. "You can with me pushing, m'love. We'll skate it out along the leading edge to the fin."

She bit off a sarcasm, seeing his long, strong legs flex. Wordless, puffing together, they maneuvered the fairing along the deltoid shell of the lander until it overhung the grass. When the fairing dropped, it formed a makeshift ladder. Hauser sank to his knees, breathing hard. Diana heard the life-support alarm and trudged away for an air bottle. Her own supply was still good; she knew Cal Hauser's work was extracting a toll.

When Paul Evans returned in a pickup truck he brought local charts, good news, and bad news. "The Qship is in its hangar and I got a jaypee fuel truck running, so we can fuel the Qship and the strap-on turbine bladders, too." A pause. "Let's erect the return mod and sleep here tonight. It isn't pretty over there."

"But at briefing they said the pilot's ready room was nice," Diana objected. "I thought . . ."

"Did you, lady? That's where I got the charts. I also walked ankle-deep in what the rats left of the deaders in there. I saw—never mind," he finished, with a phrase Diana was learning to respect.

She replaced her air bottle, then Paul's, laid the empties aside, and realized they would need recharging from the return module. Well, that was *some*thing she could do. *All in good time,* she thought, watching Paul prepare the gas generators that would swing the return module into vertical stance.

Hauser initiated the vertical sequencing alone while Diana and Paul fretted from a safe distance. Diana blanched to see the hot gas exhaust, expecting an almighty fireball to consume their mission. But the squat return module pivoted on its trunnions, accompanied by the screech and shudder of buckling belly structure within the lander. Paul loosed a shout of triumph and moments later, they heard Cal Hauser on the FM. "We concur on the angle, Grissom," he said. "And you're right, we'll fill the bladders simultaneously."

Soon the three were regrouped in the erected module. Diana stared thoughtfully at Cal Hauser's back, grateful that such brawn could be expended. Wishing she were that strong, that masculine, that capable. She did not wonder why he was so quiet.

Paul turned from the console, his ruddy young face alert, his helmet obscuring tight blond curls that gave him the profile of a Greek athlete. "So much for the day's work," he grinned. "We can fuel the bladders tomorrow. Now we can—not you, Cal," his hand gently restrained the big Canadian. "Diana, help me get air and water into

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the pickup while we still have some sun."

He was already at the hatch. Diana followed, mystified. "But the day's work is over."

"So it is," was the reply as Paul helped her negotiate their 'ladder'. "And Cal and I have the night's work to do. You can help."

As they shuttled to and from the pickup, Diana caught the edge of frayed patience in Paul's explanations. Grissom was not pleased that they had erected the return module first but could hardly enforce a countermand. Now they must push themselves to regain schedule—and Diana could extend Cal's endurance in small ways. Paul was briefed on the Qship preflight procedure, but he was no test pilot. "Still, I should be able to taxi the thing," he said airily, hunched in the pickup with their gear. "Climb in."

Hauser did not enjoy being left behind and said as much. As the pickup roared off Paul answered, "Just doing a preflight, Cal. Catch a wink, I'm not gonna run off with the damn thing."

"He's tired," Diana murmured. Paul switched to direct audio.

"Don't show sympathy," she heard him warn.

"He deserves it," she countered in their now-private argument.

"Dead right, but he doesn't want it. And if he sees or hears much of it, your sympathy could abort this mission."

"Well my goodness, why . . ."

"You don't have to know everything. I'm edgy and I'm sorry, and if that's sniffling I hear, I'm going to feed you to whatever we find out there in the—what, toolies?"

"Boonies," she corrected, glad to contribute her knowledge of the area.

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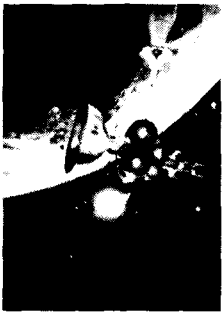

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"A hike is a boonie-stomp since *sumasaga zo' giza* Guam."

"I didn't get that."

"You mean, *ti hu comprende*; Chamorran's a mix of Spanish and islander. Never mind." The phrase worked as well for her as against her.

The Lockheed craft, its slender wing no higher than her breastbone, was a revelation to Diana. "The wings seem to stretch forever," she said, captivated.

"Thirty meters to the outriggers. Seats two, quiet as mice, and can land at forty klicks. That's *crawling*. Fitted with infrared scan and side-looking radar. Now you see how we'll sneak up on our boonie beast." He began to laugh as fuel poured into the tank. "That is, if it doesn't outrun us. With those whopping mufflers, this engine couldn't outpull a popcorn fart. Wup—"

Diana seemed oblivious to accidental gaffes. "It almost seems as if a vehicle designed to use the least energy is bound to be beautiful," she mused.

After a long wait: "By God, I think you're right. Very perceptive," he said, begrudging it.

The preflight routine took Diana's mind from the polychrome delirium of a sunset on Guam. She clambered from the svelt Qship to let Paul essay a short taxi test, and heard him ask if she could drive a fuel truck. "Why, I—I suppose so," she stammered.

"You're elected, then," was the reply. Stunned, Diana watched him ghosting away, the wings seeming almost to flap though the Qship never lifted. She found herself forgotten.

Spares from the pickup to the truck, she thought. *Well, does he have to tell me everything?* Curiously lighthearted, Diana piled their gear into the truck before ascending the cab. She looked at the manual transmission, intimidated, then recalled that no one would hear the squall of gears but Diana Moi. She could not fathom her own elation when she arrived at the lander before Paul Evans.

Diana knew enough to be frightened when Cal Hauser gunned the Qship away from them in near darkness. "He'll be okay," Paul said, reading her fidgets precisely. "It's almost stallproof unless you work at it, and it's very slow."

A subtle black shape eased up from the runway on swaying pinions, disappeared. Standing on the concrete, direct audio circuits open, they could hear only the whisper of breezes. "If there *is* somebody in the mountains," Diana asked, "won't he see the landing lights?"

Paul chuckled. "No, and we won't either. We can't see him but Cal can see everything. That image intensification stuff is lovely."

Cal's voice crackled: "I do believe this thing is idiot-proof. Passing over you at three hundred meters." They waited. Nothing—perhaps a hint of windsong.

Evans: "We'd never know it, Cal. A good ship?"

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Hauser: "I think I'm in love." Minutes later he taxied up near the lander, his mood cutting through exhaustion in his voice. "The brakes wouldn't stop a flexible flyer, but I can live with it," he said. Hauser was no prophet. "Reading for a hunting party?"

Paul and Diana stowed air and water in the Qship before the smaller man eased himself into the aft seat. "Hand me the sensors, Diana," he said. "We'll talk to you on line-of-sight FM channels. That puts us in relay to Grissom—if you don't monkey with anything."

She nodded, knowing her gesture was lost in the dark. This time she saw nothing at all of the quiet ship as it slowly gained airspeed. Feeling the awesome uncertainty of their mission as though it were some evil presence, she climbed to the return module.

Idly, she listened to talk between the distant pilot and his 'bombardier'—for Paul carried hundreds of tiny audiovisual sensors to be dropped, looking like so many pebbles, into the precipitous mountains of Guam. She understood little of what she heard. Diana's education spanned a Vietnamese hill country childhood, displacement to Guam and then California under the bumbling blanket of American goodwill, then a period of false security as a translator in the United Kingdom where she had met Joel Marcus in 1987. Despite all that, partly because of it, Diana had never mastered details that most could readily absorb. She could operate calculators but not a sportscar, could deal with an idiom yet not a rebuff. She found it a crushing irony to be left alone on a feral Earth while her technical and medical experts skimmed the low southern mountains in search of an enigma.

The mystery was simple enough to describe. While one group on the surviving polyglot satellite worked to develop better filters in hopes of straining out the viral killer of billions, a second strived to make Grissom self-supporting until, hopefully, they could outlast the virus and repopulate their home that lay so tantalizingly below. But a third group, decoding the data they accumulated with every sweep over the globe, found a striking anomaly on Guam.

The island's shape reminded Diana of a broaching whale, with a mountain lake where the creature's eye would be. She recalled the picturesque Talofofo River spilling toward its bay in a series of steep declivities. Somewhere near a tributary stream, a series of heat emissions kept triggering Grissom's sensors.

Philippine deer, wild pigs, even a few horses and cattle roamed the island—but these infrared signatures were intense, smaller than a close-knit herd of animals. Possibly a volcanic vent—except that it never occurred after dark. Vulcanism of that sort simply did not belong there, nor did the repeated trace of hot vapors that were sometimes found, almost *always* at night, always in the same vertical fastness of interior Guam. Analysts

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dared one another to say it aloud: *survivors on Guam?*

Grissom would have mounted a larger mission, had that been possible with return potential. The two reserve landers would be used as one-way passenger liners or not at all. Occam's razor sliced away all but the most transparently thin chance that a search would find humans alive, learn how they kept that way, and provide crucial data for mankind huddled on Grissom. Several volunteers did come forward. None had the necessary skills. Those skills, Diana knew, were mostly invested in a sleek Prussian-blue aircraft flitting over the southern jungle. Then she remembered the empty air bottles and set about a task on her own initiative.

Wrestling with the positive-flush adaptors to the module air suppiy, she continued to eavesdrop. The men had swung westward from the bay, climbing a valley alive with night birds. Turning at the lake, they had swept the next valley. Their charts marked locations of old IR emissions but they found no suggestive heat signatures. Then they began to quarter the area near Talofofo Falls.

"What was that? Deer?" Paul's voice.

"Probably coming down for a drink," from Cal. "They—hey, over at three o'clock, look at . . ."

Paul cut him off. "Smoke! This display is like daylight; Jesus, look out for those trees!"

Diana had an image of the silent craft plunging into the jungle. Her hands trembled on the fittings. Too much.

"I'll drive the goddam taxi," she heard Hauser grumble. "You throw the rocks." This, she knew, involved nothing more complicated than distributing camouflaged sensors from the opened canopy by hand. Some were pronged and sticky, intended to lodge in trees. Others would tumble to the ground. Their chief limitation was that the tiny audiovisuals operated on FM, which was line-of-sight, so that they must be monitored from nearby or from overhead—and flights could be risked only at night. One essential criterion of the mission was maximum data from a native subject. Theirs to observe, not to *be* observed.

Diana saw that she had begun to cross-thread an air fitting and tried to undo the damage using pliers. A curl of aluminum, unseen, rotated down inside the fitting to lodge within the valve's nozzle and pintle. Caught between worry and surmise, she finished unscrewing the air bottle hose and elected, a wisdom one step too late, to leave the rest to better mechanics. Tuned to FM and not direct audio, Diana could not hear the steady rush of precious breathing mix from the jammed supply valve.

She listened in growing hope to airborne dialogue when they found a steady emission from a hole in a cliff face. Below and to one side was a lesser emission from a larger hole.

"Could be a cave entrance and smoke hole," Paul judged.

"Hell of a funny way for people to

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live," was the reply. "No predators on Guam bigger than a coconut crab. Dogs, maybe. If you're right, they want to stay hidden. I suggest a line of sensors down the stream there."

"Right. How's your air, Cal?"

Diana glanced at the troublesome air valve near her, smiled—and saw clipboard papers fluttering. *Inside the module?* She flicked to direct audio, grabbed the hose, stared at it. She felt the cold outrush against her gloved palm and pushed frantically on the valve. It might have freed the obstruction. It did not.

". . .ciful God," her voiced knifed through on FM, and was lost as the Qship dipped below a peak. Rising quickly, they emerged from microwave shadow to hear Diana's agonized, tearful, ". . . and I don't know how to stop it! Dr. Evans, Major Hauser, pleasepleeease . . ."

Hauser was banking to the north before he knew the problem. Diana calmed enough to explain. Paul, with professional calm, said, "If you can't get the cap on, tape over it. Your glove and quickset—no, forget that. Try to plug it, Diana. We're on the way."

A half-hour later she cringed into her couch while a stern-faced Paul Evans pried at the valve seat. Arms folded, Cal Hauser glared from her to the gauges. In another minute the valve had seated, far too late to save most of the breathing mix.

Paul studied the console display, his mouth a prim bloodless line behind the visor. "So we can forget the half-rations," he said bitterly. "Nine more days of food, but now only ten of air." He seemed not to see the reddened almond eyes, the mucus-stained pad at her chin. "I'll gloss it over with Grissom. And then I think we need sleep."

They did find sleep at last. First Hauser, who was clearly at the end of his strength for the day. Then Evans, quietly furious at everything, especially Diana. Next Diana, terrified and lost in her thoughts. And finally a fourth, who lay for hours, forty kilometers away. He had seen the enormous nightbird, spanning more than many men, pass down his valley. He wondered if it could be a creature of his mind. Perhaps an omen . . .

The next morning they fueled the strap-on bladders, shuttling between the booster turbines that would be jettisoned with the emptied bladders. Fueling was completed on schedule, the sun still low on its climb out of the Pacific. The trio enjoyed a moment of optimism.

Logistics was a fresh irritation. Paul sat astride the fuselage as Diana and Cal rode in the Qship while they taxied to the abandoned pickup. There Paul dismounted for his lone foraging trip. It was just possible, Grissom had agreed, that he could locate a storage of oxygen or compressed air with filler stamps over a year old.

Diana's heart leaped with apprehension as she saw the fragile wing behind her. It flexed slowly as Cal Hauser sought altitude. The altimeter responded and Diana remembered the device

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in her lap. "May I try the sensor display?"

"We're too far for the little buggers, but—maybe not. Hell, what do I know?" The great shoulders lifted in consent.

They wafted higher. Diana flicked tentative fingers over the display control and, when she remembered to patch in the audio, instantly heard a faint shrill cacophony. "What on Earth is that?"

"Palm leaves, birds, water. Guamanian devils," Hauser cracked.

She spied a complex of low white buildings set back from shore and, with keen *déjà vu*, recognized the University of Guam. Then they were dropping lazily along the eastern shore, curving inland. She tried not to notice as the land soared up to meet them.

"The Cross Island Road coming up," Hauser gestured ahead. "We'll put down here at the Country Club."

The landing was perfect. Hauser taxied over rank grasses near utility buildings, avoiding the stately palms. A gaunt animal loped away, Diana's first recent sighting of a live Guamanian, and she realized that most dogs had already starved without their human meal tickets. *And those that haven't—look out,* she thought.

Then Diana saw dead men, or tatters of them, and could not go nearer to the main buildings. In a dull rage, Cal Hauser stalked off in search of a quiet vehicle. He returned in an open rig that was half convertible, half electric golf cart, and together they discarded the gay candy-striped canvas top. Its little diesel thrummed merrily, generating current to restore the languished batteries. The cart had not been intended for skulking but, on battery mode, would serve well.

"Can you read a map?" Hauser's tone bore conspicuous doubt. She nodded. "Then let's transfer some air to this thing and you direct me up the Cross Island Road. We have to set an FM relay on a high point so we can read those sensors from here."

Diana began to realize how tenuous were the threads of modern communication. Two hills near Andersen Air Force Base made it difficult to contact Paul unless they were aloft. And the sunspots made hash of AM channels, as Cal had warned.

They hummed along the broad drive, lurched up a macadam road, soon found a promontory. Lush green valleys dropped away on each side of them and, querying the sensor display, Diana found over a hundred sensors operating. With Cal's aid she arranged the videos roughly in order of their distribution. Audio noise was bewildering, most of it the abrasive hiss of jungle growths amplified with each breeze. The video was worse, with many closeups of stones and palm fronds. But in one quadrant they found a view that Hauser recognized.

"That's it, the place where we found those emissions. Now you sit there and monitor every God-blessed one of those things while I arrange this relay."

Fascinated by the display, she

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scanned videos by fours, then by sixes. Presently a repeated sound made her turn. Cal was gone afoot; the noise was undeniably coming from her sensor display. It sounded like someone paddling in water. She began to isolate the sensors. "Cal," she called, "I have something on audio."

"Some animal; pig, maybe."

"Do pigs swim? It's on three sensors along that creek, not far from your cliff." She enlarged them in line, one elevated and two worm's-eye views of a swift stream. "It's getting louder. I think you might come and look."

Tiredly: "Diana, I can only move so fast. Record the goddamned thing."

She was already recording, looking steadily at the display. "You don't have to be surly; good lord—MY GOD!" Her graceful asiatic eyes were round as a tarsier's, her mouth working silently.

A slender oriental of mature years moved with slow certain steps up the creek, stirring the water ahead of him with a pole. He wore a loincloth so brief that Diana felt shame for him, and nothing else but thong sandals. With a sudden practiced motion he tossed the pole aside and hopped forward, reaching into a shallow pool. An instant later he lifted a woven net aloft, staring impassively at the wiggling creatures he had trapped.

Diana saw him brush his catch into a small basket. "Maj—Cal Hauser, I've got a man, you come here this minute," she babbled. As she watched, the man strode to a rock and retrieved a short robe which lay in plain sight, unnoticed before. The robe draped over his slight, tendon-corded shoulder, the man disappeared into the jungle with almost no sound. She realized that he made commotions when he liked, and none when he chose. He was obviously adept at his business.

When Cal Hauser trotted to the cart she replayed the sequence, watching his face covertly. The cynical mask evaporated: it was Hauser's turn to gawk. He analyzed details Diana had missed, repeatedly viewing the scene. Then he arranged its relay to Grissom and, after several tries, contacted Paul Evans. It was evident that Paul could use some cheer.

"By Christ, it didn't take long," Hauser exulted. "Diana, as she puts it, has a man."

"Absurd," she flashed, then shuddered. "I—he's repulsive!"

"Not to me," Cal smiled. "My first impressions: slender mesomorph, dolichocephalic, male; looks about fifty but I'd bet my commission he's sixty-five. Got a good closeup of his eyes; pronounced inner epicanthic fold says he's Japanese, and that Mortimer Snerd haircut says he does it himself or his barber hates his guts.

"Ah, let's see: very practiced with a freshwater shrimp trap. Thongs and net, in fact all his clothes, look hand-woven from local fiber. That little tool at his waist may be a steel knife. He carries a short robe, like a judo *gi* but thinner—and he's one wary customer. Doesn't jerk his head but those eyes

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rove like uncaged gyros." Diana had missed that in her mixture of revulsion and excitement. Why did the little man repel her so?

Paul was infected with Hauser's rare good spirits. "D'you think he's alone, and what makes you think he's so old?"

"I don't know if he's alone, but: Japanese, has uniquely survived, with a travel range and actions suggesting a fugitive, entirely self-dependent. This sounds crazy but it isn't, Paul: the guy is exactly what you'd expect to find if you looked for a World War Two Japanese holdout!" Now Cal was laughing at his own notion.

"Aw, Cal, that was before I was born."

"He's no spring chicken. They found holdouts like him well into the eighties, one here on Guam in eighty-two. With this ground cover, it's no wonder."

"Then we're lucky we have Diana."

Hauser jerked as though bitten, glanced at his small companion who affected concentration on her display. "Eh?"

"If and when we meet him, he'll speak Japanese. Diana's our only direct contact," was the amused response, "if you're right. When seems ve-ry unlike-ly."

"I'd say he is Japanese," Diana put in. "Now what?"

After a moment, Paul: "I've wasted the morning here, guys. All I can think of now, is building an electrolysis plant for more oxy."

"Isn't that what they did at Riga?"

"It is, and somehow it snuffed them all. Even if I tried it, I'd be here and not there. But it's up to you, Cal."

Diana was glad the decision was not hers. She saw Hauser's helmet shake as he considered the options. "Okay," he said, "fuel that pickup and bring everything you'll need—including a rope. Our little character could be a handful if it comes to that. We'll operate from here whether Diana likes it or not. The deaders seem to've congregated at the clubhouse anyhow, and on the greens. And I always thought golf mania was exaggerated," he finished drily.

As Cal drove back toward the country club, Diana watched the monitor. She stayed in the cart as he sought an outbuilding which could protect them from weather and roaming dogs. She knew that Cal talked chiefly to assure radio contact and did not care, so long as she felt the security of his presence.

"This guy," he told her, "may be the only experimental animal we'll ever get. We can't sic you on him until we know every possible detail on his daily routines, his *modus operandi*. When we have his em-oh, maybe we'll learn how he keeps suckin' wind."

"I don't suppose you could just ask him," she offered.

"Sure we could." A snort. "You think he knows? No, we won't change his routines 'til we have to. But we'll have to take a look in that cave, for sure. God knows how we'll do that without putting him wise. What d'you

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think we should do, Paul?"

No answer. They learned why shortly afterward, while they moved spares into the club's toolshed. Paul had driven the pickup into a revetment area where he found and rifled medical supplies. Hauser, breathing heavily, took over the monitor, content to let Diana make the place livable while he rested. Before the sun stood at its zenith Paul had located their cutoff from the eastern coastal highway. Diana thought his good spirits seemed forced as the lithe medic prowled through their new quarters.

Their link to the satellite was acceptable. Most of Grissom's personnel were in a predictable ecstasy, had deliberately mislabeled their discovery 'the Ainu' in some turgid whimsy. It seemed that a party was underway on Grissom; toasts to the men, jokes for Diana.

The afternoon was endless. They did not dare approach afoot in daylight, though an unimproved road meandered less than two kilometers from the cave. It was decided that Paul could venture up the road in the near-silent electric cart, if Diana could notify him the moment their 'Ainu' appeared. Paul, with their spare sensor display clamped to the cart's windscreen, could emplace another FM relay and many more sensors before dark.

But the steep terrain required Cal to put the Qship aloft to assure constant relay between Paul and Diana, wherever the road might lead. He flew the little craft high and far to the west, beyond a chance sighting by their watchful quarry. Thus Diana was alone again, frightened as always.

Afternoon shadows stretched as Diana lazed at her post. Paul finished his work, drove up an uncharted trail for better elevation, and promptly dropped one of the cart's little wheels into a hole. "I'm maybe a klick from the cave," he muttered between curses. "I can dig myself out but I can't use the diesel. Too loud."

"This is as good a time as any," Hauser said, "to refuel. I'll need it tonight. Over the city of Agana now; give me, oh, thirty minutes to get back on station."

The refueling came very nearly too late. Diana could not say when she first realized the Ainu was staring at her. It was a process of suspicion: a suggestion of motion near the cave, a line that could be flexed legs; and then she saw, as one sees an optical illusion reverse itself, the man squatting behind ferns. Immobile as a painting, he stared toward the sensor fifty meters away. He could not possibly know the pebble was looking back at him, but nevertheless Diana felt apprehended.

She began in a whisper, then more loudly: "Paul, check your display. Sensor one-oh-six, to the left of the cave."

After a moment, Paul's reply: "Jesus, is he made of stone?"

"He may've been there for hours, Paul. Could he be dead?"

"Boy, you're just a little ray of sunshine. Nope, his eyes moved. You think he heard me working here?" He

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answered himself with, "Doubtful, but I can't risk it."

Hauser's baritone cut in on them. "Risk what? Can't I leave you two alone for a minute?"

"Thirty-two minutes, and evidently now," Paul said, explaining the problem. Paul and Diana exclaimed at once, then, as the graven image abruptly came to life and walked to the stream. Without a wasted motion, he continued down the little watercourse and was soon lost in deep shadow, moving quickly.

From Hauser: "Which way's he going?"

"Away from me, thank God. Downstream, and making good time."

"He doesn't seem worried," Diana judged. "There! On seven-three, Paul."

"He's carrying a stick and a big cloth, Cal. Sandals but no robe," Paul announced. "It's getting too dark for these sensors. You may have to pick him up—you have a better rig."

"Bearing one-niner-five," Hauser replied. "I'm en route."

"He may have heard me working on this miserable velocipede," Paul said angrily.

"If he did, he may be running for it," said Hauser, making his voice unemotional. They all knew his implication.

"You think he has another hiding place?" Diana hated to ask, but had to know.

"Good point," Paul answered. "If we lose him for a week—well, let's not." She heard him puffing as he dug around the cart.

Twice the Qship investigated IR signatures. Both were deer. Once, her display a mosaic, Diana caught movement and expanded the tiny rectangle in time to see the Ainu fade into dense jungle. He was moving along the river, still downstream, which cheered Hauser as the light faded. "If he keeps this up he'll end in Talofofo Bay and I'll see him."

"Doing what," Paul asked. "It could be important! *Damn* this little rig, this little road, this little time . . ." He began to remove the batteries so that he could wedge the little cart out.

It was full dark when Hauser spotted the solitary man. He moved along the southern edge of the bay, engaged in some sort of gathering ritual. The Qship, its engine nearly below operating speed, passed as low as Hauser dared. The Canadian admitted his defeat in a series of sizzling curses.

"I'm hurrying as fast as I can," Paul huffed. "I have to get down there and see what he's doing."

"Without the IR scope?"

"God*dammit*," Paul raged, "Diana's got it! So I'd have to drive past the effing bay to get the scope. Cal, any ideas?"

Again that unruffled confidence. "Only the obvious. With its more obvious drawback: have Diana take the scope, drive down nearby in the pickup, and try to get near without being seen."

Diana, tremulously: "What's the drawback?"

"Never mind," from both men.

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Your incompetence, she heard.

The job seemed an easy one. She grabbed a spare air bottle, tried the simple IR scope, and found she could easily drive while peering through its circular display. She stopped once to obey an order. "If you don't smash those brake lights, Moi, I will land this thing and strangle you with my bare hands," Hauser warned.

Abashed, she did it with a stone. "That's better," said the voice from the Qship somewhere above. She resumed the drive, stopping short of the bay as Hauser directed.

She skirted the narrow inlet afoot. "Cross the bridge," said Hauser. "That's where the river takes its dump in the bay. Your man is two hundred meters out on the south shore. See him?"

She did, but faintly. She hurried along the road, cut through a gate to move along a low cliff. Through direct audio she heard the lonely bittersweet rhythm of waves aswirl in the rocks below.

"Stay there," said Hauser, startling her. "Sneak a peek. You can see him just below you."

Diana inched forward, scanning the shore. She took a fierce glee from Hauser's error; his own angle permitted a view, but hers did not. She shifted in a gambit of her own, eased between crumbly footing until she was braced only a few meters above the salt spray. Then she saw the Ainu, and realized what he was collecting, and averted her face in abhorrence. And slipped.

Her first thought, on caroming from the ledge into the bay, was *I've lost the scope,* which was true enough. Her second was *my suit is torn,* which narrowly evaded truth. Her third was, *I'll drown.*

The worst of it was humiliation as she heard her plight described by the inevitable, invisible Hauser who circled above. "So much for stealth, Paul; our dumb broad bellyflopped right beside the Ainu. He's scared shitless, up against the rocks, and she's in the shallows and can't even stay on her feet. Thanks, Grissom, you sure pick winners . . ."

Hauser saw her stagger to her feet, hands beseeching, saw the little man kneel with arms extended toward her. He was beyond describing the travesty of a woman literally covered in advanced technology, rescued by a cave dweller.

Nor could he understand a word of the conversation between them. It was brief, and it ended in mutual retreat. Hauser guided Diana toward the road again, half-persuaded to talk her off a higher cliff. She managed to steer the pickup back up the road by starlight. Hauser followed the Ainu, lost him in the retreat upriver, then located Paul Evans who had at last got underway.

It was another half-hour before they convened in the toolshed. "I don't believe this," Hauser snarled. "Life is a dirty joke, and the joke is on me, and I don't get it."

"Sure simplifies our options," Paul grinned ruefully at the big man's frus-

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tration. "Diana, what's the idea of the Ainu calling you 'Commie'?"

Still trembling, reliving the storm of emotions that had clashed in her during the encounter, she steadied her voice. "A *kami* is a local spirit—a sort of Shintoist deity. He wasn't reaching for me, he was doing obeisance and I just grabbed his hands," she said.

Hauser grunted with new interest. "A magic woman? May be useful."

"Gender isn't essential to a *kami*," she said. "Lord, that awful little man . . ." and shuddered, wiping her hands for the hundredth time.

The gesture was not lost on Hauser. "That's your own childhood you're trying to wipe away, Moi."

"Don't psychoanalyze me," she spat.

"Don't bullshit *me*," he said evenly. In kindlier tones he continued, "I saw your dossier, Diana. 'Moi' isn't even a real surname, it's a Vietnamese tribal tag you got saddled with. We can't help it if you're still running from a label; hick, savage—" he shrugged, "—whatever it means to you."

She fought her tears and won. "It means grinding poverty. Apologizing for your existence—and having the apology rejected." She straightened small shoulders and faced him squarely. "Maybe I'm doing some rejecting of my own. Maybe I've had enough of people who, who,—who eat filth!"

"Just because he was gathering bloody palolo worms," Hauser sniffed. "Moi, people do that all over the Pacific. Or did."

"It's a polychaete that swarms about this time every year," Paul explained, retreating from Diana's personal quandary. "Perfectly good nourishment, Diana. If he dries and smokes them, it may be a diet supplement factor we're looking for."

Hauser stretched out on the floor, flexing his limbs. "At least it didn't happen in his front yard. He's probably holed up in his cave by now." The pilot began slow pushups, difficult maneuvers in the heavy suit.

"Well, we're certain he's Japanese," the physician mused, then flicked an irritated glance at Hauser. "Stop that, Cal. It wouldn't help if you did a million."

Hauser lay prone, his voice muffled. "Just keeping fit."

"Just wasting air—and killing yourself." The words were Paul's. The faint groan, Diana realized with a shock, was Hauser's. "Sorry," Paul added softly. "I might've chosen a better phrase."

Mystified, Diana shifted the topic. "He said his name is Shigeo," she said. "He has the oddest phrasing and accent, but he's certainly Japanese. We have his language, his beliefs, and his name."

"We don't have diddly-squat yet," Hauser rasped. He was holding a troche under his tongue, the chin dispenser still ajar under his visor. "But you, blithe spirit, will solve that. And more."

"I haven't helped much so far."

The long, endorsing silence was broken by the pilot. "Tomorrow will be your day, Diana. I think we're

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agreed it's a waste of time to cruise the Qship around tonight over—uh—Shigeo, is it?" Two nods. "So let's get some sleep. Suit alarms for five ayem. When our little man comes out tomorrow morning he's going to find you all set for a nice long chat. Paul? You concur?"

No one asked Diana's opinion. She lay awake, listening to the men breathe, hoping she could control her aversion to the worm-smeared animal. No, she must think of him as a person. *Shigeo—Shigeo—Shigeo.* It would not be easy.

Sitting quietly, a spare bottle slung at her side, Diana Moi waited before the cave. She resisted the urge to look behind her, knowing that Paul was too distant and well-concealed. Hauser had stayed at the shed to conserve air and assure their relay to Grissom, just in case. She had both FM and direct audio on-line, and slowly cultivated a headache trying to localize sounds. When the little Japanese emerged, then, she mingled relief with her loathing.

"*Konnichi wa,*" she greeted him, and wisely allowed him to complete rituals of obeisance. His assumption of inferiority suited her perfectly.

"The *kami* is welcome, I am unworthy," he said in that curiously inflected but clear Japanese. She saw that he was scrubbed clean, his loincloth meticulously mended. Diana knew that she did not have to maintain eye contact because he would not dare establish it.

She forced herself to comment favorably on his prowess in the jungle, his tailoring, his health. The voice of Cal Hauser jarred her with, "Whatever happens, don't admit ignorance." She nodded in irritation. Little Shigeo, plainly mystified by the gesture, seemed about to ask a question but thought better of it. Diana smiled; she would seem more inscrutable by the second.

"It pleases me," she began, resuming her seat on the stone, "to observe you at closer range than usual." He bobbed his head quickly, eager to please. In a flash of empathy she added, "It would please me to hear a civilized tongue. Speak."

"What would the kami hear?"

"A song, perhaps. And then a story, Ai—Shigeo." Well, maybe he thought her slip was *hai,* yes. So far, so good.

He begged the *kami's* pardon, his singing was a caterwaul, he had not the talent. She said he was modest and suggested two stories instead. To this he readily agreed, adding, "Which tales would the *kami* prefer?"

"Tell me of the things I see you do in daily life; and the things you seldom do. Which foods you like the most, the things you dislike doing. *Dozo,* Shigeo," she wheedled politely. "Tell me truly; an untruth is *kinjir',* forbidden." She ended with an amicable teasing inflection to avoid offense.

Squatting before her, his private parts ludicrously exposed, he began a halting monologue. His life was steeped in small drudgeries. Weaving fibers on a bow loom; mending his

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shrimp net; catching a huge fruit bat; feasting on a pig; absorbing a sunset. These were his pleasures. He was less pleased with the robber crab, which invaded his lair; and with the *taifun*, which threatened to drown him in it.

From time to time she injected the, "*ah, so des'ka*," you don't say, or "*shigata a nai*," too bad but that's the way it goes, of a good listener.

Once, Paul Evans interrupted her. "Is all this germane?"

Hauser: "Anything's germane; shut up, Paul. We're lucky he's taking this contact so calmly."

The fugitive's greatest trial had been a great *taifun*, many years before. A towering tree had fallen across his burrow, collapsing the earth upon him. He had fought his way out, found another home. But he had been forced to steal new fire from a party of the islanders who, he said, were eaters of men. At this he rolled his eyes and, to Diana's amazement, made the sign of the cross. He saw her start and misconstrued it. He clenched his eyes shut, ducked his head and drew an inward hissing breath. He hoped the *kami* was not offended, he said, by the *Deus Catolico*.

"Iye'," she denied. In English she said, "Merciful heavens, this animal has been converted—I supposed by Spanish-speaking priests. And they filled him with lies about the Guamanians."

"Maybe; and maybe he's testing you. Take nothing for granted on a first contact," the anthropologist chanted his faith.

Shigeo was watching her, perhaps wondering at the sounds that emanated from the gleaming head of this strange *kami*. Yet his eyes did not stray above her knees. She made no explanation for her behavior, even when she made the switch to a fresh air bottle with carefully slow movements, talking all the while. "It would please me," she lied, her voice shaking at the thought, "to visit your home."

Only his eyes showed fear. It was too wretched in his hovel, he said; too unworthy. She persisted. He made fresh protestations of its unsuitability, unspeakably polite, unshakably firm. The little man did not want the *kami* in that hole. Period.

She changed the subject. "The other story, Shigeo. Tell me how you came here."

For the first time, he really smiled. His teeth were remarkably good. "The *kami* is not far-ranging, *neh*? Forgive me, I forgot it could not know me before I came here. *Wakarimas'*, I understand."

"*Hai, domo*," she thanked him, and waited.

He had been a mere foot-soldier on Kyushu where the good fathers were accepted by a powerful *daimyo*. Shigeo had been conscripted from his fishing boat at Nagasaki to fight in the great war. When it appeared that the enemy must inevitably conquer, they had returned to Nagasaki. A shipload of soldiers escaped, helped by a priest. To her question, he replied that he had not reached this island early in the war. *Iye'*, no, it was panic flight from

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Kyushu the day before the planned surrender.

Was it not dangerous to land? *Hai*, indeed it was, but he had little choice in the line squall that swamped his ship as she beat toward a little bay on the island's western flank. Some of his companions were caught. He soon found that his chances were better alone and, except for brief and terrifying trips in earlier days, he had rarely left the sanctuary of the interior jungle since then.

But recently he had seen no people, and let the season and the Moon tell him when to gather sea worms. The *kami's* miraculous emergence from the sea had left him shaken. But honored, he amended quickly. *Hai*, covered with honor.

"Let me think aloud on this," Diana said, and began a rapid-fire translation. Grissom would provide analysis later, but she knew that much of a translation depended on nuance, small gestures, malfluencies; all the communication lying below the symbols.

"I never knew there were so many escapees after the bomb the Americans laid on Nagasaki," Cal murmured. "Ask him about it."

She did so. *Go mennasai*, he was sorry, but he had seen only the fires started by enemy weapons. He had experienced no great thunder and slap. She passed this on.

"Then he wasn't there on *that* day," Hauser rumbled. "This isn't getting us anywhere, Diana. Ask him how long he's been alone and what he does to keep healthy. Maybe he does have some ideas," he sighed.

She asked the necessary questions. He had long ago ceased reckoning the length of loneliness, he said, and added a shrewd point: unlike Kyushu, this island had little climate variation but for the rains and storms. Why keep a calendar?

As for keeping fit, he stayed clean, toyed with carvings to ward off depression, and had great confidence in an herb tea which he had developed over the years. The wrong herb, as the *kami* knew, could kill quickly. Two wrong herbs, however, could be beneficial.

The right herbs? "*Banzai*," he smiled shyly, almost sadly.

Diana knew she had already slid into the trap of asking things any intelligent spirit should know. But he had perhaps felt himself tested. She risked another test. It would please the *kami* if he would offer a sample of the herb tea. A large sample. Now? Yes, she husked, and realized how long she had been talking. In an hour she would need another air bottle.

The slender Japanese whisked between two stones, pulled a decayed log across the hole, and was gone. Diana quickly added her new information and heard a jubilant Paul Evans curse happily.

"This could be it," Hauser agreed. "Get the stuff in a sample container, Diana. You're sure he won't let you into that hole?"

"Yes, and almost as sure I couldn't do it," she quavered. "I wouldn't know what to do in there anyway, Cal."

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"Hold on," Paul cautioned. "Don't count on this herb infusion; it may be all, part, or none of the answer. And if you can't go in the cave, I'll have to. I need blood and tissue samples from him. Keep the aerosol handy, Diana. We'll tell you if it's necessary."

The aerosol had been intended as a defensive weapon, or so Paul had told her. She listened to the men argue tactics, noticing a wisp of smoke from a hole several meters up the cliff. In a few minutes, Shigeo returned.

The 'tea' was dark amber, presented in a crudely handsome piece of raku pottery. She thanked him, dipped a gloved finger in it, and pronounced it excellent. She sensed his disappointment at her odd method of enjoying it, and let him stare as she poured it into a container. And then she saw the toy he had carved.

"Your fishing boat," she guessed, genuinely pleased, hearing the exclamations in her headset.

"*Iye', kami-san*; the *barco* of the priests *Catolico*." He moved nearer, pointing out the high sterncastle where the white men stayed. This was the vessel which had carried him to Guam. Diana held the model up, turned it this way and that for the watching sensors. She began to murmur her translation as Shigeo explained that the three tiny triangular sails were the membranes of bat wings. A gnawing sense of disbelief tugged at her mind, as little as she knew of sailing craft. Wooden three-masters in 1945?

"Hold everything, Moi," came Hauser's reply. "Oh, Christ on rubber crutches, this can't—" With an effort he began again, speaking very slowly. "Ask him who the enemy was in his great war, and what the weapons were."

She returned the model with great care. "I believe, Shigeo, you did not say how your enemy fought. Nor his name."

"We called him the ugly peasant, *kami-san*, even we who were only *ronin*, common soldiers. His men fought as we did with arrows and great swords, sweeping over all the islands until they came to Kwanto and Kyu-shu. There was great killing. Those of us who had accepted the *Deus Catolico* feared we were marked for special torture. Ah, *mate'*, wait: his name was Hideyoshi." She was a phrase behind in her translation when the last word emerged.

The yell in her headset came with the name. It almost rattled her into overlooking the other word for the second time. *Deus*, from Latin, was not Spanish at all. It was close. It was Portuguese.

"Paul, goddammit Paul, you realize what this means?" Cal Hauser was chortling, his voice almost a whisper. "Barring the possibility that Shigeo is the greatest actor and scholar of our time, you're looking at a frigging sixteenth-century mercenary. The sonofabitch is over four hundred years old!"

The little man gazed more frankly now at Diana, who knew her actions

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must seem odd. Then from Paul she heard, "He is either feeding us a long thin line, or he has antibodies older than dirt. In either case I have to check him out as soon as humanly possible. Zonk him with the aerosol, Diana. Zonk him *right now*."

Diana could not bring herself to such direct action. Instead she began, "I see into your *hara*, the core of your soul, Shigeo." As she arose, hands outstretched and high, he knelt as to a priest. It was so easy, she thought, *and why do I feel like a cheat*? The little aerosol spray was in her hand. *That's why*. "I approve your *hara*, and I offer you a dream." With that she triggered the aerosol. His head jerked up in a brief astonishment; then he began to grovel backward until his legs failed him. Finally he lay still.

While she waited for Paul, Diana heard Cal relay news from the satellite. "Diana, why didn't you tell us *'banzai'* means 'long life'? Grissom's confirming our wildest hypothesis. Paul, that model is an early lateen-rigged caravel. He even has the big mast up forward. Broad beam, holier-than-thou sterncastle, all of it. The guy must've worked on ships, all right; he made a fair copy of a Portuguese ship of 1585.

"Oh; there were Jesuits on Kyushu when Hideyoshi finally subdued and unified Japan. He was a famous general—but just an ugly peon to poor Shigeo. Hey, Diana, that was no mistake about early Chamorros being cannibals. Some were, before 1600. It seems that Magellan found a good anchorage on the western side of Guam."

"That tallies," Diana replied, "with something Shigeo said about his ship being wrecked near an old port. I think he tried to go back later but—Paul, over here," she broke off abruptly.

Paul Evans stumbled up, loaded with equipment, too excited to talk. He knelt beside the unconscious Shigeo, rolled him over with gentle hands to begin his work. The trained hands seemed to fly, pause motionless, fly again. Diana could not watch it all. Biopsies, blood samples and smears, even stool samples, all obtained with a dispatch almost as incredible as their discovery of Shigeo's age. There was a hoax somewhere, she felt. No four-hundred-year-old man should have good teeth, black bristly hair, nearly smooth golden skin and a monkey's agility. She concentrated on the monkey angle, afraid that she was beginning to think of him as a person. She did not consider the irony of that.

"There," Paul said, returning lab samples to his kit. "Give me the holocamera and canisters, I'm going into that cave."

She helped him squeeze between the big stones, worn smooth by many passings, and watched him disappear. "Better talk on direct audio," she warned. "And one more thing: have you considered that he may have booby-trapped the place?"

Utter silence for long seconds. "No, by God, I hadn't. But what can I—oh. Maybe this will help." A moment's

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wordless grunting, then: "Shoving this collection bag ahead of me. Bouncing it around. It goes down here; drainage hole, maybe. Then—" A muffled impact, another silence.

"Paul?" It was a scream.

"Oh, I'm here," came an echoing sheepish voice. "Damn near permanently; you were right. A weighted spike, like a deadfall. No wonder he didn't want you in here. I can get around it, though."

At length Paul returned. "Wish Cal could've been down there. So many variables! A wick he uses to keep his fire going; food of all sorts, breadfruits, dried shrimp, herbs and medicines in little pots; roots,—I don't know." He hefted the canisters with their stolen samples. "I just don't know . . ."

"He'll know you've been in his cave," Diana accused.

"Tell him you did it," Paul said, "or—Cal, what *does* she say?"

"Whatever fits a *kami*," Hauser answered. "I'm on shaky ground too. Best thing is to learn what he wants that we have. Or what he *thinks* we have. We need bargaining power, Diana, and interaction. Anything to—to—"

"To keep me underfoot here instead of there," she finished for him.

"If you want to put it that way," Paul nodded, darting a glance at the twitching Shigeo. "I'll be waiting; don't be long." He hurried off with his booty.

Shigeo awakened slowly with all the signs of a hangover. He struggled to his squatting position, holding his head briefly.

She donned her most innocent act. "Did you dream?"

Impassive: "Perhaps. I do not know. The sleep brought pain; but not so bad as the pain a year past."

Intuition creased her thoughts. "Tell me of the pain last year."

"The *kami* knows I journeyed three days. Does it know I found no people but dead ones? I felt gladness at first, but at last only sorrow. While returning I fell ill." He described the sudden dizziness, the blinding headaches and sores, the cramps and bleeding throat that waxed and waned as plague began to ravage a human body.

Diana translated the essentials, including the crucial, "The *kami* knows I returned and lay here ill for days. Has the sickness returned?" He felt his temples gingerly.

"No," she guessed, hoping she was right—then spoke a phrase too many. "You returned in time."

He studied the ground for several moments. "I may make the journey again," he said at last.

"If you do, you will surely die," she replied. *And so will we all.* "But let us think on pleasant things. Think, Shigeo: for your pain, what compensation would please you?"

"Death."

His reply had been shatteringly simple. For an instant Diana had a glimmering of the man's life, and his weariness with it. "That is Shinto," she said, "but you are Catholic."

"Even a *ronin* can be both." A hint

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of challenge. Something close to a smile crossed his face. "It would not be fitting to ask a Shinto *kami* for—*nani mo*, never mind," he shrugged.

"Ask, Shigeo."

"For a Catholic priest."

She laughed. He seemed not offended. "This might not be possible. But," she added quickly, "I will think on it. Nothing else?"

Bitter longing, hopelessness, remembered pleasures, all crowded into the word: "*Onna*, woman."

A pause. "Yes. I see. Nothing else?"

"I have named three things." Unspoken was the charge that the *kami* seemed unable to provide anything worth having.

Paul's voice jerked her from the fruitless confrontation. "Diana, I *have* to get this stuff back to my equipment. Hurry."

"I will think on it," she said again to Shigeo. "Live here as always and wait for my return soon. Do not follow. It pleases me to walk as you do," she added, and turned to go.

"It also pleased you to enter my home," he said sullenly, noting the bootprints.

Different sized prints, at that. "I assumed different shapes to accomplish it," she said, knowing the lie was silly. "It did you no harm."

He made no response, but moved slowly toward the cave on unsteady feet. Diana knew the interview had ended badly.

When they returned to Cal Hauser, the spirited three-way conversation lasted until Paul, engrossed in dyes and microscopy, began to utter asides to himself. Then Hauser dozed, and Diana saw the rugged face in complete repose. The heavy strain lines were permanent creases, the eyes deeply recessed under their lids. She wondered how long it would take Cal to become his old vital self again, once the mission was complete. *Cal looks so tired.*

"Shut up, Diana," was Paul's whispered reply, and she realized she had voiced her concern. "Just keep your mind on your monitors."

Shigeo was near the cave, drying flat baskets of palolo worms in the sun. Without turning from the display she asked, "Are you sure it was plague Shigeo had, last year?"

Long, long pause. "No. Symptoms could've been jungle rot, plus food poisoning, plus strep. Only where'd he catch strep?" Another silence. Then, "If only we had time to let him try again. Boy, this is old tissue. Too bad we're not up to cloning him." Longer silence. "Whatever's working for him at the cave, it evidently wasn't working when he changed venue. What does he leave behind that he ought to take? Well—at a guess, if I did everything he does at the cave, I could be here this time next year."

"Or a thousand years from now." Hauser's wakefulness startled them both.

"Maybe." Paul continued to work. "But no maybe about this: we'll save air if you sleep, Cal. Diana can handle the display."

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Presently, as Hauser lay under his blanket of medicated sleep, Paul brought up the subject of Shigeo's desires. Death was the one thing they could not deliberately give him. A priest might be managed, if Shigeo would accept a video link to Grissom's sole bishop who, in any case, spoke no Japanese. Still, the priest was a possibility. Paul stared at nothing. "The woman is a nice problem."

"Over my dead body," Diana countered.

Paul grinned. "A straight line I could follow two ways," he said, "one being that if you weren't already dead, you soon might be. I wonder about his acculturation. Would he accept a man instead?"

"Only you would think of that," she grumbled.

He replied quietly, "My preferences aren't your problem. His are. Don't forget that."

"All right, I'll ask. When?"

"I don't know, it may never be important. Right now, saving air is important. Take a pill; I'll wake you."

But it was Carrol Hauser whose thundering curses brought Diana up from sleep.

The big man shook with rage, grasping Paul's air bottle as though it had committed some terrible offense. "If I hadn't seen the telltale, how long before you'd have told me?"

"Just before the bottled air runs out," was the too-quiet reply. Paul did not cringe but seemed ready to ward off a blow. Diana, still sleep-drugged, lay quietly confused.

"By what right did you decide you were so fucking expendable that *you* could try the filters?" Hauser dropped his hands, raised them high again. Dropped them again.

"I've done my job," Paul said. "There are lots more things we can do with extra days of air for you two. At worst, I could treat myself for days, and at best we can all be breathing filtered air in a week. It's a risk I had to take."

"ONE of us had to take," Hauser shouted. "I'm still commanding—all right, *lead*ing—this mission. I could've been the guinea pig!"

"So who pilots us back to Grissom if the filters fail?"

Hauser dropped heavily into a chair. "If I have to spell it out for you, I will. The return sequence is so automated even Moi could initiate it. You knew I plugged it into the console for her. I'm the only one who could stay behind *and* pilot the Qship *and* run a longitudinal study on Shigeo. I could've been experimental subject number two," he finished, nearly crooning his agony.

"Admit it, Cal. You wanted to justify that in hopes you'd get a remission." Diana saw the look of mutual understanding pass between the men. "And there's absolutely no evidence it would work for you. It might for—for an average specimen."

"Nor any evidence it *wouldn't* work! Tell me, *doc*tor, where do I have the better chance, on Grissom with the best modern facilities, or here with

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this impossible Japanese Methuselah?"

Paul turned away. "Don't ask, Cal. As a friend."

"You mean no chance either way." The thunder was dying, now, the lightning spent. Hauser's voice was old. Old.

"I don't know." Softly, lovingly.

"But in your vast wisdom," Hauser continued, "you removed my justification for taking the risk."

"That's true," Paul nodded, studying his gloves as though some answer were written on them. "I swear I never thought you'd want to."

"I still might, if those filters seem to work." Hauser grabbed for a spare bottle, missed, grabbed again, then collected a pocket illuminator. "I'm going for the refills."

"Okay, let's leave it at that," Paul said as the larger man moved into the darkness beyond their shed. "Should I go along?"

Cal Hauser refused the offer and kept walking. Diana could not believe her suit's temperature readout; it suggested a comfortable level but her marrows had frozen through, twice in the past minute. First, Paul had opted for ambient air, which might not only kill him but would leave her without medical aid. Second, Hauser was threatening to do the same—which could place her utterly alone, thirty kilometers from a return module she had never dreamed of piloting.

She listened until Hauser's gruff transmissions reported him headed toward Andersen in the Qship, bearing thirty-five degrees. Then she spoke on direct audio. "Does this mean Cal has plague?"

"You heard, then." He sat loosely, emptied from hours of mental and physical effort. Eyes closed, he continued. "No. I may have it, though these filters just may do the job. We'll know in a day or so. But Cal Hauser has something more cruel, in some ways. We call it Korsakoff's syndrome."

"Meaningless to me," she prompted.

"Of course. It's a form of accelerated aging. Tissue loss, muscular weakness, eventual early senility. Cal could've gone on, under Grissom's half-gravity, with serious trouble for a long time. Until brain tissue loss became severe, anyhow.

"I knew it. We just didn't realize he'd tire so quickly down here. Not so soon. Not to a specimen like Cal Hauser." Paul bored his gaze into Diana's face. "Can you imagine how this wasting, inexorable disease would affect a man like Cal?"

"And there's nothing anybody can do?" Her throat constricted as she heard a scientist chipping away at the pedestal where she had enshrined Modern Science. "Medicines? Surgery?"

"Oh, some chemicals to help the body take nutrition. A tall order when your cells are shot through with collagen—fibrous tissue that blocks other tissue functions. But," he shook his head, "it's not as simple as an arteriosclerotic process. When he begins to lose brain mass you'll see true senility.

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With luck, he has a few months."

Diana nodded. "That's why he's been so quiet, sleeping so much?"

"He's bone-tired, Diana. All the time." Paul reached to his equipment, brought out a vial of amber liquid, swirled it reflectively. "And he thinks Shigeo's patent herb tea can send all that into remission."

"Why couldn't it?"

Another long, slow headshake. "Too many processes to reverse. Even if Shigeo has stumbled onto an antiviral better than the amantadines, it just isn't likely to cure senility. I suppose it might've somehow prevented it." He replaced the vial.

Diana rechecked her monitors, trying to divert her mind. She selected a mosaic and watched idly until Hauser's call.

He was apologetic, the voice almost reedy. He dared not risk a return while clumsy with exhaustion, he said. He was in the module with air bottles and would stay until morning. "Grissom reports some heavy weather building that might affect us. And another thing, Paul," he said after a moment. "You'd better tell Moi about me and the big bad K. My vanity isn't worth her confusion. It might help."

Paul had the grace to pretend he had not already acquainted Diana with Korsakoff's syndrome. She saw moisture in Paul's eyes as they ganged their air bottles for sleep. There would be no Qship sortie that night. Nor any other night.

It was almost noon when Hauser radioed that he had rechecked the automated liftoff sequence with Grissom and had stowed fresh bottles in the Qship. Some of his vitality had returned, or so it sounded to Diana's ears. For the first time in her memory she welcomed jovial curses.

"Getting breezy out," Paul observed through a begrimed window. "Stick with the monitors, Diana. I'll help Cal unload."

She heard Cal announce his arrival overhead, was later glad she had sent him a cheery greeting. Paul flooded the carburetor on the pickup, quickly switched to the cart, and steered the little open vehicle toward the golf course.

Diana was disposing of an excreta bag when she heard Hauser's cry of alarm. A grating thump sounded in his headset and she raced outside to see Paul Evans sprawled in a sand trap, a stone's throw distant. The cart, now twenty meters from Paul, was slowing. But the slim-winged Lockheed bounced over the grass between breeze-swept palms. Its dropping wing would almost certainly pass over the recumbent Evans. And then Paul struggled to his feet, hands out, obviously disoriented as he moved forward.

She heard Hauser shout for Paul to drop flat, heard Paul's mumbled apology, and saw the Qship fight for altitude as Paul, erect in a shambling run, headed toward the cart—and toward the Qship that approached at a ludicrous, stately, deadly pace.

There could have been no real ques-

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tion in Cal's mind that the underpowered craft might soar aloft. The best he could do was to swoop the Qship into a brief stall, nose high, airspeed disastrously near zero as he passed over Paul Evans—who fell again, would have passed safely beneath in any case, as Hauser clawed the ship to a sharp angle.

For one unforgettable beat there was silence, the Qship balanced on her tail, one wing tilting from a sudden gust of wind. Then the splintering frenzy of polymer and wood as the aircraft fell tail-first, safely beyond Paul, folding the starboard wing which absorbed much of the impact as it crumpled against the turf less than fifty meters from the shed. The port wing slashed across the electric cart, carrying away its windscreen, demolishing its sensor display in the same instant.

Diana started to run, then stopped. She was very near fainting. She saw Cal Hauser relax in the cockpit as if overtaken by a great weariness. There was no fire yet. But Diana's breakfast was rising, a potential calamity in her sealed environment. "I'm sick," she gasped, and sat down facing away from the scene.

"Then stay away," she heard the medic snarl. "I'll help him."

She was still pale and frightened when Paul returned minutes later, the cart still functioning and laden with air bottles. Body shaking, he stumped past her, dropped a ruined water container in the doorway. She whirled toward the crash, then managed to follow Paul into the shed.

"Goddamned idiot," he faltered, swinging to face the doorway. She thought the comment was for her, but: "Tried to cram an extra ration of water into his lap. Punctured. Wasted. Like him."

"His suit is punctured, Paul? Cal's hurt?"

Evans stared away toward the wreck that now began to send smoky tendrils into the sky. "It was a massive frontal skull fracture."

Fists balled, he fell to his knees. "Cal, *dammit* Cal,—oh Jesus *Christ!* Why didn't you just run me down? Now I've killed the ship and you too!"

An icy stolid steadiness gripped her as Diana knelt behind him, laid her arms along his, sorrowing that the helmets prevented closer contact. She knew now why Paul would not extract Hauser from the wreckage. They watched the Qship burn, a pyre for *Lonranger-san* who would never know senility now, who had wanted to take a gamble that was not really a sacrifice but, on an instant's decision, had chosen a sacrifice that was not even a gamble.

They felt the muffled impact of concussion as the fuel tank finally exploded. Fragments of spruce and plastic showered the area. Huddled in the doorway with Paul, she saw the bathhouse begin to burn from the roof. In minutes, the flames would reach out for them across the intervening breezeway.

Her priorities were short-ranging:

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Paul in the cart already piled with air bottles, his medical kit next, then more air and food from the shed. She moved the load to another shanty nearer to the access road, solicitious of her human burden, undisturbed by the cursing until she realized it was her own.

She left Paul to retrieve more gear and precious samples, only to find the searing heat too great for close approach. No Qship, no herb tea, no sensor display or comm set outside their suit units. But the scorched pickup truck started for her. She drove it back to Paul careful to park it on a downslope, and tried to shrug off their new vulnerability as she spied Paul slumped against their supplies.

She felt anger at Carrol Hauser, and shame at her anger. His last act had been selfless—but not wise. Even Cal could make a fatal error under pressure. Her dependence on male competence was crumbling. Beneath it, she saw dimly, lay the self-assurance she had hidden away so well, so long ago, with her pride in her primitive people. Shigeo had not made that mistake, she reflected. From this insight she accorded Shigeo a certain respect.

Then, sorting her memories of the crash: "Paul? What's wrong with you?" She had misinterpreted his gasps as emotion.

"I've really done it, killed myself too." He retched with graphic results. She leaned against his back, helping him sit up, trying to deny the truth. "A lot of crap about treating myself. A fool for a patient. True." He cramped again, a dry heave that shook his wiry body. "Thought I'd have more resistance. Some do. But I was candy. Twenty-four hours almost on the dot. Candy," he repeated.

"What can I do?"

"That's quite a riddle. Sorry," and he rolled forward on hands and knees. "Get this suit off me," he mumbled. "No use now. I can deal with the nausea, at least."

In a forced calm that caged her fear and served as detachment, Diana struggled with the seals until Paul lay prone, the suit peeling away like rabbit skin. She could not tell if he was fevered, could only lend support as he found his way to the single bunk in the place.

Between spasms of colic and an evident splitting headache, Paul directed her to capsules in his kit. When he could not swallow, she broke a capsule into his slack mouth. She detached a water flask from his suit, dribbled a bit into his mouth.

Bustling about in efforts to make him comfortable, she stopped to say, "If we can move you in with Shigeo, then . . ."

"No! He's already spooked. He'd just disappear." Paul was racked by coughs. "God, my throat hurts."

A million lost opportunities assailed her. Cal's air and water left plugged into his suit; comm sets in the Qship and the burned shed; her own clumsiness with the air valve, and for that matter with Shigeo.

Lost; all lost. Every new contact prodded Shigeo toward retreat. He

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would never agree to nurse a dying stranger. *Unless it was a geisha,* she thought wryly.

Or a priest. "Paul?" He was conscious, his pallor leaving him for the present. "Could you pose as a Catholic priest?"

"In my skivvies?"

"I'll find something for you to wear. I'll translate—uh—freely. It could work, Paul! All you have to do is be a good listener."

"And give him plague." Paul shook his head hopelessly.

"Think, damn you! He's had it already. Do you want his help or don't you?"

Paul managed a wan smile, then an inexpert sign of the cross.

"No, left side, then right," she corrected.

"A lot can change in four hundred years," he said still smiling.

"I'm going now. I'll be back soon." Forgetting caution, forgetting even a spare air bottle, she hurried to the pickup and began her unique scavenger hunt.

The town of Ylig was only a few kilometers up the coast. From a thick-walled traditional church there, Diana took several carven crosses, candles, a small cast madonna, and a sadly frayed little velvet cloth. She tried not to see the remains of worshipers, shriveled husks lying in endless abasement for some global sin. She tried but failed to locate priestly vestments in other rooms, racking her memory for an image of a priest in the solemn splendor of his rank. There were so many denominations and variations!

A lot can change in four hundred years, Paul echoed in her mind, as she stared at a row of choir robes on hangers. Quickly she gathered up several of the white garments, ignoring the dust that rose wraithlike in the stillness. Within the hour she was struggling into their shed with her ecclesiastical trappings, gasping the last of her air bottle's reserve.

Late in the afternoon, Diana found herself plucking at the false surplice now draped over Paul Evans, and knew that the setting was as realistic as she could manage. Paul was coherent, propped in the bunk, even amused in his drug-induced fog. "Don't forget Dr. Shigeo's celebrated herb elixir," he said. "And anything else he'll share. That sennit wick or whatever he burns—who knows?"

Diana promised, pausing in the doorway. She knew better than to relax; exhaustion would consume her in that moment. Paul's skullcap of blond curls, sweat-plastered to his forehead, lent a priestly cast to his features. She wished she knew more about Catholicism. "What religion are you, Paul? I never thought to ask."

"Lapsed athiest," he said, then brightened. "Make that *pro*lapsed," he added in mincing burlesque and began to laugh, playing to some internal audience of his own. Diana slipped out, uncomprehending, willing that he should indulge his harmless pleasures.

Shigeo heard her approach the cave, came down the creek to meet her. He

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dropped the shrimp netting and did formal honors. She caught wariness in his expression and wondered if Paul's tests had meant lasting pain for Shigeo. She made formal thanks for the welcome before proceeding to business.

"It is possible, Shigeo, for you to see a priest." The wariness stayed, now mixed with new interest. "Yet he is ill and will die unless you help him. It would please me if you came to his aid."

"What does the *kami* wish me to do?"

He brightened as she enumerated her simple requirements. Careful to avoid any hint that he would also be helping her, Diana requested a feast for the *padre Catolico,* complete with herb tea brewed in Shigeo's fashion. It was important that he bring his own fire, she added.

Shigeo bowed himself into the cave, returning with a woven bag full of oddments. In his other hand was a cunning contrivance that held a coil of coarse fiber rope, the smouldering end well-protected. "If the father is ill, perhaps my medicines will help, as well," he said, then asked craftily, "or will they? Will he die?"

She paused, affected a haughtiness she could not feel. "*Kinjir',* Shigeo; do not ask." She motioned him to follow.

Shigeo showed great curiosity but little fear at the growling contraption that Diana drove. He had seen automobiles many times. *Hai, wakarimas'* he understood that the priest spoke no Japanese or even Portuguese. *Hai,* many things change in time. *Iye',* he had not visited this area since the new people came with their growl-machines and heavy, ungainly buildings. Chagrined to hear that his own people had occupied the island for a short time less that fifty years before, he chided himself for a fool. And all the while, he watched the sun and the hills.

Keeping your bearings, eh, she approved. *Alone with a lying kami, so would I.*

Diana led Shigeo to the shed, not deigning to look toward the still-smoking rubble in the distance. But she could not suppress a cry of alarm, seeing Paul in a fetal crouch on the floor.

Paul had obviously been up and around again, feverishly tallying the precious store of air and water, now hers alone. Together, the ancient Japanese and the young Moi woman placed Paul Evans on the bunk. Diana kept one eye on Shigeo as he set about coaxing a tiny blaze on the bed of sand he prepared. The balance of her attention was on Paul, breathing noisily as he fought his losing battle with a pitiless antagonist that was no farther from Diana than the thickness of her glove.

Shigeo displayed his small hoard of foods, making of it an oddly attractive arrangement. She elected not to repeat the capsule she had given Paul earlier, fearing overdosage, and kept a silent vigil as darkness overtook the island. She lit votive candles from the fire,

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which Shigeo seemed to approve. Then she saw the small hypodermic syringe on the floor near Paul's head, its semitranslucent contents reflecting the flicker of the candles.

She placed it on a windowsill, watched Shigeo husband his embers, and then heard Paul say, "My lord, fella, but you're ripe."

He stared at Shigeo in open, friendly curiosity.

Shigeo moved near, murmuring devotions. Diana knelt to one side, half-listening, yet straining to hear Paul as he spoke around the pain in his body. In Japanese she said, "The priest hears you, and surely God does." Softly she continued in English, "The cross in your hand, Paul. Hold it up if you can." Shigeo kissed the talisman with reverence. "He's brought the herb tea and lots more. Can you eat or drink?"

A slow nod. "Soon. Fixed—syringe with—soup of my own. Over there," he tried to point toward his kit which was in disarray on the floor. "Can you—find a vein?"

She remembered the little hypodermic from the floor. Paul lay with eyes closed, frowning at each breath's fiery effort. She fumbled the cover from the needle, remembered to clear its barrel of air, then probed for the blue line at his elbow juncture.

"Florence Nightingale—you ain't," he grunted, trying to smile. His eyes were bright with hope as the lids fluttered back. Shigeo had ceased his murmur, watched spellbound as she located the vein and eased the plunger home. For a moment there was no response from Paul. Then a slow ecstatic inhalation, a lambent smile. Followed by a gasp as Diana withdrew the needle. "Oh, my Christ," Paul said. He blinked twice, slowly, a dawning horror in his face as he spied the syringe. "Where'd you—find that?"

"Why, on the floor. What's wrong?"

He seemed to sink in upon himself, breathing easily now, staring at the ceiling. "Supposed to be—under my pillow. Hoped I wouldn't need it. You were supposed to—use the big ten ceecee job over there." He nodded toward his kit.

Her eyes sought and found the second loaded hypodermic, lying in the gloom. She inhaled deeply to avoid screaming. "Paul. What did I do?"

"Ah, God, it's good not to hurt." Then quick, lucid: "Diana, stick with him as long as you can. Give yourself a day to get to the module. Liftoff access word is 'klutz'; sorry 'bout that. You may not hit Grissom exactly, but they can get you home. You won't like the sterilization process, but—"

She gripped his arm. *"What was in that hypo?"*

"Had it hidden, in case things got too bad. I'm no hero. Morphine sulfate and—something else. Never mind. It's faster than plague, and a whole lot kinder." He peered into her visor, searching for credibility. "I didn't intend this, Diana. I swear to God."

In ghastly self-recrimination: "I've poisoned you."

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"My own stuff, my own fault. I must say it's a gentle slide, honey." He was smiling now, his nose wrinkling. "Boy, this little guy has an air about him. What's he waiting for? What do I do for him?"

"He's confessed four hundred years of solitary sin, Paul. I think he wants absolution."

He chuckled, a clean healthy sound that ravished her with irony. "Don't we all?"

"Not me," she said. "I've done nothing to merit that."

Paul closed his eyes, fought them open, mumbled, "What do I say to him?"

Diana gently took Paul's hand, laid it over the bristly scalp of Shigeo. "These phrases may do it. Say them aloud." She spelled them out for Paul.

"Ego te absolvo," Paul whispered. *"In nomine Patri, et Fili, et Spiritus Sancti.* Sorry I can't—try your smorgasbord, Shigeo."

At the sound of his name, the little man looked at Paul to Diana. She controlled her voice with difficulty. "You are forgiven, Shigeo. For everything; your sloth, your desires, your anger at God. Everything," she said again in Japanese.

She did not know the moment when Shigeo slipped out into the enveloping dark, did not care. She was not crying. She was much too empty for that. He murmured a word. "What, Paul? What?"

"*Banzai,*" he repeated. "Long life, right?" His eyes were on her again, calm, young, unaccusing.

"Yes."

He fumbled for a gloved hand. She gave him both. *"Ego te absolvo,"* he said.

"He's gone now."

The gentlest of squeezes. "I know. That was for you, love."

At last the hands no longer pulsed, respiration ceased, the flutter of tiny muscles halted their play across the face. Once she murmured, "It would be, wouldn't it? The last word you ever spoke . . ."

Diana roused herself at last to arrange air bottles for the long night, pausing only once in her slow rituals. She stared at the medical kit, at the life-giving, death-bestowing mysteries of a science beyond her knowing. She could not explain why she gathered it all up, made the kit tidy, and then smashed it into junk with an empty air bottle.

By the time Diana awoke, the great satellite had completed its direct pass, as it did every few days, over the island. She could not know that the shed was a barrier between her headset and the anguished transmissions from Grissom. She knew only that she was more alone than Shigeo. He at least had his God. Her faith in the mass of interlocked sciences was dead. They had proven a false malevolent deity. *Faith without knowledge; is that the problem*?

She shelved the question, loaded the pickup, returned one last time to the shed. For minutes she lay full-length

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on the bunk, sharing her warmth with the rigid form of Paul Evans. Then she was in the pickup, driving in a fury toward the cave. She knew Shigeo had not become lost, even in the dark. A week's water, still more food and air: time enough if she did not waste energy. She could remain near the cave, promising whatever was necessary, and could return to the module in her metaphorical eleventh hour. She knew nothing of optimum launch timing because Paul had not thought to tell her. Lacking contact with Grissom, neither did she worry as Grissom did, for she could not look down on the cloud reefs beyond her horizon, reefs that gradually spun into the shape of a spiral nebula.

She picked her way to the cave loaded down with air bottles. For a moment she did not understand the new shrine that sat before the cave. It was both Shinto and Christian, and below it lay a trove of handmade articles. Food, raku ware, carvings, nets, even the small fire wick that Shigeo had taken from the shed. By the ash, she judged it had been there since dawn.

And then she saw his small iron knife and translated Shigeo's message. All his wordly goods sat before the shrine. He had received absolution, even for his desire to die. A Catholic could not suicide, but Shigeo might search for an agent of death.

Shigeo did not intend to return.

The pickup's horn was a mournful hoot, more likely to speed Shigeo on his way than to draw him. Diana feared, too, that he would avoid the soprano-voiced *kami* under any circumstances. Shigeo had spoken warmly of the town where many ships had stopped, of his long watches alone from cliffs overlooking the settlement with its river and its fort. *Agana,* she thought, and received confirmation from her maps. The city sprawled along the western coast midway up the whale's back. The cross-island road was quicker by car, but it would be easier going along the lowlands afoot by the northeast road, avoiding the swordgrass.

With a four-hour start, Shigeo might be halfway to the city by now, unless he met a big dog—or a pack of them. She knew he would not shrink from such a meeting. One death was as good as another when he had waited so long for it.

She searched the road far ahead, expecting every moment to see a small golden man tirelessly jogging toward his destiny. Then, on a hunch, she circled around the most direct approach to Agana and parked atop a hill over the main road. When Shigeo trudged up the highway she would see him from above.

After several hours, Diana tired of fighting eyestrain and drove to meet him. *I keep developing these little faiths,* she reproached. *Hope, then belief, then certainty. And cynicism when the hope proves false.*

After recrossing the island narrows she changed air bottles, rested, and studied her maps. Apra Harbor, with

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its naval base and imposing breakwater, could have been Shigeo's goal.

She drove back through Agana and along the cliffs to Apra. With approaching darkness she waited for a sign of smoke, an unusual sound borne on the breeze, anything.

Nothing. She drove back to the cliffs over Agana before full dark, lights off, scanning the city and listening again to the croon of a wind that masqueraded innocence from the sea. She ganged her air bottles and slept.

The next day began with a fruitless search. The pickup had less than half a tank of fuel. If she returned to the module she could contact Grissom, but might not fare any better in her search for fuel. *And why run to Mama when I have nothing Mama wants to hear?*

She elected to seek solutions where she was, yet a two-hour search for Shigeo and fuel proved a waste. A scrap of billboard writhed past a downtown intersection, harbinger of a rising sea wind, and direct audio hinted at a moaning in the trees. The weather front approached too slowly for a local shower, she knew. Diana continued searching for fuel; cans, gravity-fed tank, whatever. She dared not risk an unlabeled fuel and her suit prevented identification by odor.

It never occurred to Diana that she might simply puncture fuel tanks of automobiles and collect the effluent. When at last she thought of hand-pumped siphons, the sunlight was diffuse in a burnished gray-brown haze. The wind was no longer playful.

She had driven some distance from the parts shops, unconsciously fleeing from the sea. Reversing her direction, she stared into the featureless wall of sky that already pummeled the vehicle with wallowing gusts. Winds on Guam had been known to exceed 280 klicks. She respected Shigeo's fear of the typhoon now.

The pickup was pelted by horizontal raindrops like metal pellets. She found that the wipers did not work, peered through the glass, and slammed the brakes as a palm frond flayed the pickup's hood. As she released the brakes, the pickup began to coast backward. Up an incline.

She ran the pickup past sloping lawn into the lee of the first big struc-

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ture she saw, snatched up spare bottles, was hurled up concrete steps toward a doorway. Through the glass she saw front desk, files, viewers. It seemed a final insult that some dying hand had locked the public library.

Diana would have run to the pickup but literally could not move against the awesome wind. She hunkered down, squatting atop her air supply, wondering if she could have punched through the glass with a sledge. The wind rose insensibly to a gutteral howl, spattering her with foliage and, once, a bird. And eventually brought the sledge.

When the great palm fell three blocks from Diana, it sideswiped a bank, freeing a molded cornice which fled before the spendthrift wind. One great fragment bent like a three-meter boomerang spun on the gale, hurtled invisibly through the storm.

Tempered two-centimeter glass has its limits. The cornice struck the steps in front of Diana, ricocheted into the glass at shoulder height. Face averted, Diana felt a staggering impact against the bottle on her side. She bounced against door facing, glass disintegrating above her, and was pinned by debris. The largest piece, a triangle of glass the size of a coffee table, dropped like a guillotine, missing her arm but not the suit. She saw the curled edge of nulon past the rain-swept visor, knew the tough plastic was shaved away. She suffered a hallucination of herself, trapped there, passing through the torments of plague while the typhoon still raged. She would die of anoxia before that.

No, I will die when I'm damned good and ready. She flailed at the glass with her free arm, the wind her assistant. Wooden framing shifted and she was free, half-flung through the shattered doorway, bottles clanging after. She scrambled for the bottles, stumbled into the main card-file area. The pocket illuminator revealed what she had not dared hope: the glistening nulon, though shaven, was not penetrated. With luck she might outlive the typhoon.

The eye of the storm passed after dark, giving Diana time to search the place. She wondered how Shigeo had managed so well without modern trappings, and the question followed naturally: *what was Guam like before this century?*

The wind began to pound the building's backside now, as Diana pursued her new suspicion. The main files told her of site studies by archaeologists Reinman and Calkins. These led her to the special collections below, away from the triphammer wind. She scanned curled photographs, maps, manuscripts which resolutely spelled *Agaña* the old way. Her gaze fell on an old photo, badly tinted, of a picture postcard setting.

The village of Umatac lay before her, stark white houses lining the southwest shore. Dominating the harbor was the inevitable church. To the east lay low peaks which, from their other flanks, fed the stream that fed Shigeo.

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Magalhães, Magellan, had landed there in 1521, she read; only traces were left of the ancient fort. Her charts revealed a stream that, in heavy rains, Shigeo might call a river. Her fingers shook with excitement yet Diana refused to attach all her hopes to this surmise until she had checked other locales. Umatac was too near Shigeo's haunts, too pat an answer. She had taken enough of those.

Hours later, her illuminator failed. Somehow she slept through the hum and slam of the furies outside and in the morning she found the city quiet, lacking even the birdcalls she had taken for granted. She found the pickup, its windows smashed, cowering in shrubs against the library foundation. Eventually it started.

Imperceptibly the storm damage decreased as she drove down the coast. To the south the road climbed along green ridges, and then she came upon Umatac. The town had been spared the typhoon's full rage. She wondered if the return module had fared as well.

Diana eased the pickup along, let it glide to a stop when she spied the whitewashed steeple cocked over ragged palms. Then she walked. There was no reason to feel such certainty, such faith. He was here, or he wasn't. *Then why are you so sure*? She studiously rejected expectation—and walked up the church steps expectantly.

He squatted, head almost between his knees, below the Virgin. Diana stepped between the sprung main doors, her eyes adjusting to the gloom, the sunlight streaming in behind her. Certainly he had heard her footfalls but had not stirred; might have been of plaster. His ability to keep still, she knew, was astonishing.

"Shigeo." She began imperiously, then let the name trail off. After a moment he arose, turned, bowed. He made no other move, gave her no expression to interpret. "Why do I find you here?" *Asinine question. You know why.*

"The *kami* said God might let me die," he said. "I am waiting."

"Nothing is certain. He may only punish you for risking death."

He thought on this awhile. "This is true?"

Enough! "I do not know, Shigeo. In this place and time, I must be beyond lies. There are things I do not know, or cannot tell. But I honor this place—no, I honor you—by telling no lies."

"The priest. Did he die?"

The briefest of hesitations. "The man died."

"But in the service of God."

She shrugged. "That may be. He did it in the service of people. It was a risk he took deliberately, Shigeo. There was another man as well."

A quick glance around him. "He is here?"

"He is—is dead also. He did not deliberate the risk he took but, when it came, took it quickly."

"Seppuk', suicide," he murmured, impressed.

"*Iye'*, not exactly. But sacrifices."

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"For what?" Shigeo asked.

She swallowed hard. "For all people now living, or who will live. There are only a few left, Shigeo. Anywhere," she waved her arms wide. "They may all soon die, as you will, if you do not return to your home. Truly, for them to live, you must live."

"*Shigata ga nai,* can't be helped." Yet he was troubled.

"*You* can help; I have tried. My *hombun,* duty. If you really believe we return after death in new bodies, it is your duty too."

The tranquil mask slipped to show the tortured man beneath. "There is no *wa*, harmony, in my days. It is an endless dying," he whispered.

"I have known this in my *hara*, soul, as well." A flash of something crossed his face, his body muscles stiffening. "Are you well, Shigeo?"

He slowly squatted, put hands to his flat belly. "Yesterday I thought the *kami* lied about dying. Then I thought the *taifun* was blind and walked over me without seeing." Another muscle spasm, and he rubbed his abdomen. "Today I believe the *kami*. Yet this is smaller sacrifice than living," he said.

"That is true," she nodded. "Dying is easier than living in—some ways."

"Then we agree," Shigeo said placidly. "*Iye'*, I will not return. There is no advantage in the greater sacrifice."

"We do *not* agree," she cried. "There is the advantage of the very greatest honor, if the act benefits all people."

"*Iye'*." He defied the *kami* without malice, fear, or hope.

She searched for some lever to move him from his resolve, grasped the one that had grown unexamined within her. He might lay death aside, if—. *Complementary opposite sacrifice,* she thought. *Well, how much do I believe the things I say?*

Diana knelt, facing him directly. "Would you choose to return to life in your home—if you had a woman? Even a clumsy *maiko*," she added in false gaiety, using the word for a novice geisha. The rumble of her heart filled her with terror; fear that he would accept.

At last he consummated her fear. "*Hai*, if I took her to wife."

With fingers that balked, thoughts that raced foolishly from squalor to striptease, Diana undid the seals. Her helmet off, she pulled her blue-black hair from its knot and shook it. Shook it again, this time proudly, as she met and conquered an odor she had known from childhood. *I won't smell like frangipani when I'm on his diet, either,* she thought. It steadied her past,—*if I live.*

Few things, she guessed, had ever strained Shigeo more than the effort to maintain calm as she removed the suit. There was nothing graceful about her one-piece undergarment or the body attachments she removed, but like most underwear it followed her body faithfully.

A slow admiring smile from Shigeo. "More *kami* magic?"

"You will find that I am only a woman. These clothes protected me.

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Now you will protect me." It seemed more true as she thought about it.

He dropped his hands to hang between his knees and Diana saw evidence of his desire. And of his essential humility. "This is wrong in this place," was his only comment.

"It is only a final honesty, Shigeo. I do not think it wrong. But truly I tell you that we must go in the growl machine to your—to our home, or I will surely die soon. I may die in any case."

"As the priest did?"

Her resolve to be truthful met its test, failed and passed it in the same equivocation. "If he was not a priest," she said, "perhaps a saint." A silence fell between them.

"You will come with me," he said then, and stood. She sensed his effort to be the forceful husband, feared he would be gauche in his new role, knew she would be in hers. For which he would beat her. Carrying the suit, padding behind her primeval master, Diana Moi strode into sunlight.

After three days, she knew that Shigeo would survive the plague symptoms that racked him.

After ten days, she wondered if her own bouts of illness had been plague, or merely the result of the damnedest diet she had ever seen. She had quickly recovered on the same diet. Diana could not know which factors defeated plague, but that was secondary. *Something* did. This was primary.

After fifteen days, her nostrils became accustomed to their new stimuli. And she was beaten, lightly but firmly, for tearing a shrimp trap.

There was a purpose to the motions in Shigeo's daily life that Diana had not seen while watching the sensor displays. Soon, she knew, it would be necessary to get his approval for a quick trip—if the growl machine would start—to the return module. The typhoon had destroyed or displaced the FM relays in the nearby hills, she judged; twice she had received line-of-sight transmissions from Grissom in her headset, though they obviously could not hear her replies. Grissom was cautiously optimistic at seeing the lander still upright after the great storm, and very patient with the silence from below. They would have more optimism and less caution after she talked to them.

The next lander might contain a hundred experts, one-way volunteers, convinced that if Diana Moi could make it, anybody could. She would insist that they not invest Shigeo's life with a plague of people.

Or, in a less tasteful scenario, they might remain at a distance to study every detail of her days for the benefit of all. Their rationale would be impeccable. And sooner or later, she was sure, she could end her forced atavism.

She sighed, spread the palolo worms for a fresh drying after the autumn rain. It would be no pleasure to know they watched her most private moments, but it couldn't last forever.

Could it? She glanced at Shigeo. *Banzai* . . . ■

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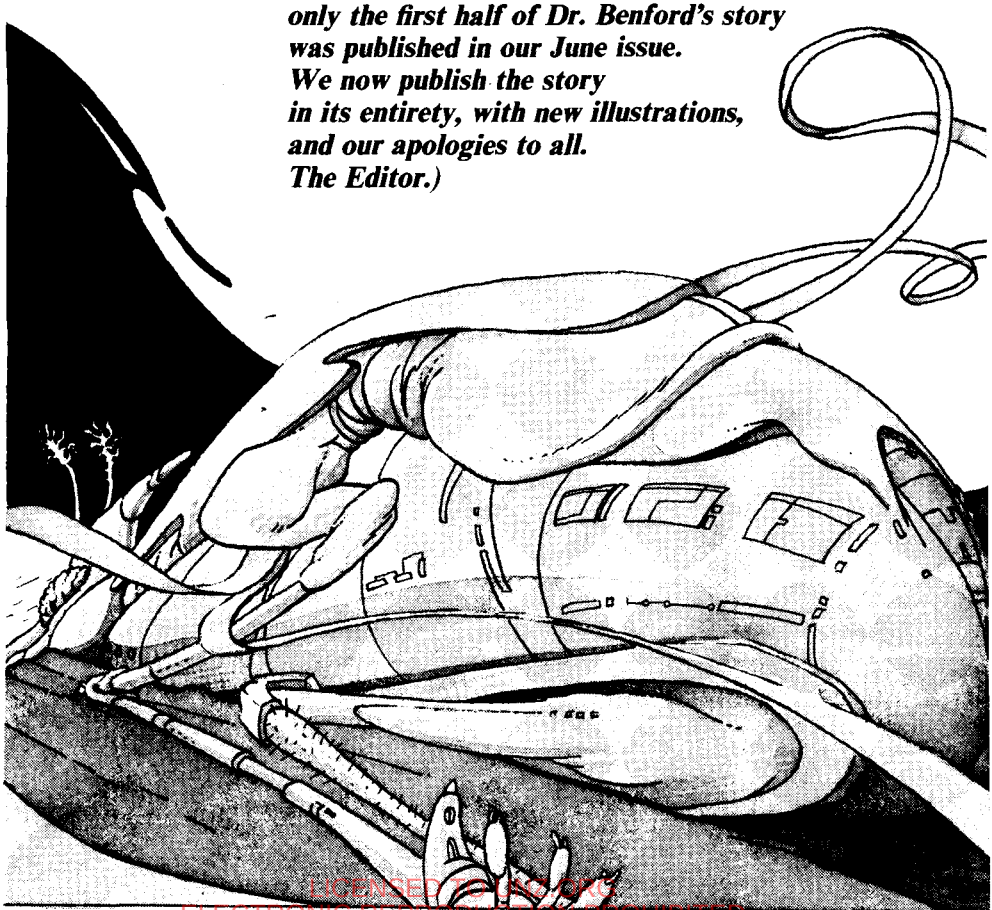
GREGORY BENFORD

starswarmer

(Note: Due to an unfortunate error, only the first half of Dr. Benford's story was published in our June issue. We now publish the story in its entirety, with new illustrations, and our apologies to all. The Editor.)



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Clinking clacking jittering, Qath strode the slashed land. A final hill loomed between her and the Syphon. Qath articulated widely, legs grating, yawning, and surged over the apex. A stone outcrop shattered on her underbelly and ground away with a brittle shriek. Qath tuned out the wail of tearing metal, even as she felt the alloy rip and a storage vat pop, the sulphuric mix gurgling out. She paid no heed, she peered ahead. There, blooming skyward in orange plumes, would grow the Syphon.

: : Where are you, slit-eye?: : came a burst in Nimfur'thon's sweet-sour tongue.

: : Coming askew you on 97°-42-In8, monopod: : Qath spat in reply, though hissing to take the sting from her jibe.

: : You will stumble, prang yourself, and be late.: :

: : You faxed you would be *heclens* from the Syphon. Yet I read you within the zone of second-order radiance: :

: : So I am: : Nimfur'thon said this with an elaborate, shimmering aura that framed her chuckle.

: : That is too close. The Tukar'ramin specifically *warned*. Interchange modes of the jet can snarl outward: :

: : They are mere statistical fluctuations, low-limper friend. Thermodynamically bounded. Feedback stabilization will catch the bulge and tuck it back in to its mother sac.: :

She stopped to measure her position, using fixes on two nearby peaks. There were no moons circling this world; for easy navigation, they should have put a small artificial one in place. But the podia did not plan on being here long enough to justify the trouble.

Qath surged downhill, clanking jingling ringing, as her pods found footing on the skittering stones. She arrowed on Nimfur'thon's peeping redness. Calmly, letting no color into her warble, she said

: : Still, we were mandated to stay three *heclens* away: :

: : Monopody, you. We said we would come together and watch the plasma dance on the hills. How to see it otherwise?: :

: : I, we have—: :

Qath's mind clogged for an instant as she sensed a servo whine—*eeeeeeii*—in a forepod. She thought of the Tukar'ramin safely working in the Hive, beyond the brimming ridgeline. She and Nimfur'thon should be there, celebrating with the rest of the hive's brood. Instead Nimfur'thon had persuaded her to come here, against the Tukar'ramin's directives. Qath had tramped these hills many days with Nimfur'thon as they labored together. They had struggled with the fluxtube canisters. Nimfur'thon had splintered a pod bone when a bulkhead tipped over. She had been unable to walk without agony until Qath, boosting on rockets back to the hive, fetched an artificial replacement. The new pod shaft worked better than the natural organic one, as usual. Qath envied Nimfur'thon the fresh pod, for

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the other was now faster; she had no natural pods left.

: : Your ossicles overload at this small flight?: : Nimfur'thon sent in sharp chatter. In parallel she lifted a sing-song, *I, we have: I, we have* on a sour sideband of her carrier, taunting.

: : No, I—I—: :

: : *Ground-burrower*, you become. *Cicada*-Qath. Your thorax trumpets, but at the cusp moment—: :

: : Enough cyst-sucker! I am soon to be upon you.: :

With a lurch Qath birthed a rosy egg of flame beneath her and jetted up a granite-flecked cliff face. All through Nimfur'thon's chiding Qath had been planning, vectoring. Now, expending all her maneuvering reserve in one spurt, Qath arced up the stony wall and—fuel guttering out in a black fog, rockets choking down—she scrabbled at the boulders of the peak. Clutched. Teetered on the brink. Fanned the blue air, and caught. —*jit-jitjit-eeeee*—screamed a linkage, but Qath scrambled to safety, feeling the warmth as her center of gravity slid into snug position above solid ground.

: : Take homage here!: : Qath barked as she sighted Nimfur'thon's squat disk on the plain below.

: : How did you—? Ah, squeezed out your last dollop of fuel. Not wise.: :

: : *You* bray of wisdom? *You*, who jibed me into ambling here?: : Qath felt suddenly exposed on this high point. She spied sheets of phosphorescence hanging in the air—near, chillingly near.

: : You have the best view.: : Nimfur'thon temporized, her rippling signal now betraying a thin thread of doubt.

: : The Syphon forms,: : Qath said. Yellow steam gouted from a jumble of hills. Mudworked buildings crescented the ridgeline, temporary housings for the fluxtube formers. : :It's coming. I think we should—: :

: : Yes, go down the reverse slope, Qath, away from the Syphon.: :

Qath scrambled downslope, sending boulders clattering with her bumpers. : :And you? We must hurry.: :

: : I will cross this plain. We meet in that low rut, there—: : Nimfur'thon squirted a vectored grid-image : :—and watch the Syphon.: :

Qath could hear her heaving grunt as she geared up in haste.

: : We *deserve* a good gaze at it. This is our first, not like a vinegar-souled multipodder who's bored with it. And we have labored hard for these moments.: :

Qath ignored these repeated justifications and focused on the skittering gang of rocks that herded before her, racing and leaping downhill. No moment to be buried in the embrace of pebbles, no. She skirted a ledge, made a controlled slide—

: : Qath—there are animals here!: :

: : Impossible. The area was burnt fine. Run, you—: :

: : No, I have stirred them out with my pounding. They swarm from their

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pits. It is quite safe.: :

Qath turned and crosshaired Nimfur'thon on the plain. Dots jiggled about the gray-white disk. : :Flyers. Birds.: :

: : No, *hoppers*. They are the worst. Pests, into everything.: : The disk that was Nimfur'thon lapped flame at the dots and they blackened, tumbled.

: : Move on! We have mere moments!: :

: : No. I sense there are more here. What if they have gotten to the fluxtube formers? They could spoil the Syphon.: :

: : Run.: : She ceased looking and lurched at full gear down a narrow ravine.

: : I can pick up their thrummings now,: : Nimfur'thon cried. : : There are many here. They stretch in long lines.: :

: : Seeking food. Grazers. But you must leave that exposed plain. *Now*.: : Chuffing, clenching, she jounced down the steep cleft.

: : We must call upon the Tukar'ramin. These pests could be in the fluxworks—: :

: : Then they shall soon be scoured *out*. Witless, we *cannot* call the Tukar'ramin. Forgotten, have you, that we are here without mandate?: :

: : Yes, *there*, I have flamed the last. There be more—: :

: : Forget them: :

: : You are right. I come.: :

The sky crinkled.

: : *Fly*! Time does not allow—: :

: : I am. I am firing—: :

The sky shattered.

Qath slid to a stop, tucked in pods, *snicked* ports and shields fast. The air sang an ionized blue. From the low hills lanced up the fluxtube, ripening pink to red to orange. Wind howled and clutched at Qath's rim, thin fingers to tip her over. Qath tuned frantically to the brood's channel, to call out, and instead was flooded by the brood's view, from the far ridgeline.

The fluxtube grew straight and true from the skirt of hills, biting the ceiling of clouds, boiling them away in a purple flash. It climbed up, up, in an instant had cleared the ivory clouds with its heat. Now the black of vacuum appeared, a spot forming high up, a target coming into being as the arrow shot through it. Stars winked new.

Now the upper link was forged. The tube opened on the clean vacuum of space. They had watched it climb, eyes smarting, awed at it. The brood sent forth a chorus of applause, a popping and frizzing song.

Complete came the Tukar'ramin's warm signal. Now the fluxtube hummed with new life.

It was a transparent string of electromagnetic fields, hollow at the center. The intense fields exerted pressure as the tube thrust down, deep into the rock of this world. The tube walls kept back the pressing rock on all sides while the tip probed deeper. Vast stresses fought along the tube walls. The tip gnawed, burning a cylinder of stone free of its mother world. The top of the tube was in the vacuum above, while immense pressures pushed the

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freed rock upward from below.

Complete the mellow, unhurried voice of the Tukar'ramin came—and the fluxtube suddenly filled.

Its pearly, transparent walls of force turned mottled gray. A plug of rock was streaming out.

Qath called : : *Nimfur'thon*: : in the roaring, pelting gale. The wind's pebbled teeth clattered on her skin. : :*Nimfur'thon*!: :

: : Here. I landed, but am exposed.: :

: : *Hold*.: :

: : Blinded, we are, my monopoddy. This grimy breeze—: :

A rolling blast burst over the hills. The fluxtube brightened. The cylinder filled, pink to red to white.

: : *The core*—: : and out it spurted. The lance had struck to the center of this world, to its treasure. The fluxtube had flared out as it bared downward, to surround the ball of molten nickel-iron at the core. The tube throat was artfully shaped like a rocket chamber, fat at the planet's center, then narrowing as the white-hot metal funneled up from the core, increasing the thrust. The nozzle connected the vast core pressure to the void of space. The riches squirted up and out, fleeing the groaning weight of this world.

Qath squinted. The fluxtube walls glowed. Liquid metal shot through it, blindly rushing toward the stars. She was totally caught up in the transmissions flooding her. The Tukar'ramin's view of the tube shimmered.

Delicate streamers of green and amber danced amid the white fires. Precious metal fluids—the only horde this wretched, moonless planet boasted. The tube sucked this life out, up, through the air and above the blanket of gas. The view tilted, following a black fleck of impurity up the thin glowing line. Starwards. Through the black disc, into sucking void. The fluxtube curved away, high and beyond air's clutching. There, at the rim of the dark hole, a wire cast in space. The tube peeled over until it found an orbit for its pap, and then released the boiling metal. The yellowing, shuddering fluid, free of gravity's strangle, shot out into the chill. Returned to the spaces it once knew, the metal cold-formed, mottled, crusted its skin with impurities. The birthing thread creaked and groaned in places as it unspooled. It fractured in spots, yet kept smoothly gliding along its gentle orbit. Cooling, it grayed. Graying, the threads would make the frame for their work here.

: : Qath! Something—: :

Qath, dazed, fixed on Nimfur'thon. But the signal faded. She sent a burst to the hive through a haze of noise. An answering tone came, and the brood view at once tilted back down the glowing string of metal, to the hills. A hurricane wind had flushed clear the air. The eerie light of the core metal dappled the plain with shadows. But something wavered—

The tube. It twisted, hummed, curled into a helix, straightened again. Light surged in the walls. A bulge formed. It grew. Qath watched the image, awash in it. The fattening flux-

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tube rippled. Flexed. And looped suddenly, faster than eye could follow. Out, across the plain. The metal soup escaped. A blinding white ball spilled over, splintering rocks, spreading. The gray pancake of Nimfur'thon, crouched in a shallow draw, was singed where the bubbling liquid first touched. The tide hesitated and then lapped over, blackening, blackening, blackening everything.

: : Nimfur'thon!: :

The burnished shape did not answer.

The legs jerking. A ripping scream. Footpads melting where they touched bubbling white. Nimfur'thon turning, pods splintering. Skin popping open. Guts pouring out to flame into brown smoke.

Nimfur'thon's walking pods melted slowly into the ooze, her manipulating pods clutching frantically at the sky, as if to pull herself up. Orange plumes cracked the upper bulkhead. Armpods beat at the flames in spasms. Yellow tongues ate. The bulkhead blew open. Gobbets spattered.

This was the way Qath would remember Nimfur'thon. This vision seared away all other memories. For what seemed a long time Qath could see nothing but this licking moment of death. Her opticals registered other inputs, but her mind rejected them. She stood frozen. Silent. She began to tremble.

The Syphon guttered out. The helical instability was diagnosed and work parties crossed the plain toward the fluxworks. They carried Nimfur'thon's remains, sectioned, back to the hive. Few spoke to Qath, not because they considered her shamed—inspection of Nimfur'thon's tracer log showed her to be the instigator; the risk was her own—but rather because they were busy restoring the fluxtube projectors, which had fused to slag. As the teams worked, Qath sloughed back to the hive. Her joints and seams ached from pinpricks of damage. Dani'vver, assistant in training to the Tukar'ramin, sent beeping questions during Qath's march, asking details of how the two had maneuvered so close, and—from supple dartings of phrases—sensed the cloud that now descended over Qath.

There followed a rest period, which Qath embraced, even though she felt in the warren walls the strumming of motion from the multipodia, who did not rest. The looping instability was a setback, throwing off their schedule. Overhead, hundreds of their fellow strandsharers orbited, awaiting the gouts of metal to begin their weave. The pace in the hive must quicken, then; Qath knew this. Yet she fell into slumber gratefully, legs folded close and tight in the slick webbing; for something pursued her.

Qath woke panting, pods tangled, the speckling of her tracheae bulging red, yellow, red again in fevered rhythm. There was a buzzing call for her that echoed through the groined alcove. Qath answered and found a

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summons from Dani'vver. She dismounted anxiously. For some reason her mind was a snarled maze. Her hydraulics knotted and filled with a pressing ache. She hastily smeared a vomit-drop on an acrid spore. This eaten, Qath quadded inward, resting one leg which had splintered a knee. She limped through vaults astir with repair work. A pentapod hailed, but otherwise she was ignored. This was nothing new, and in fact was what Qath desired this day. The weight that had descended upon her did not welcome company.

: : You realize you are blameful?: : droned Dani'vver at the entrance to the central chasm.

: : Of necessity.: :

: : Your Ascension will be slowed.: :

: : Yes.: :

: : Addition of a manipulating arm, to render you: :—Dani'vver consulted her slate, rather than look directly at Qath : :—pentapod, will be delayed.: :

: : Yes.: :

: : It is good that you reconcile so easily. Some do not have that ability, though they be multipodia.: :

: : Yes.: :

Dani'vver flicked open a port, studied Qath, and said : : Despite your *ratafelu*, the Tukar'ramin will enter you.: :

Qath felt the spaces within her suddenly open and the fear flood out, squeezing her spiracles shut until the air wheezed through tight slits. She was sure Dani'vver would notice. The wall parted with a soft rumble that hid Qath's rasping breath, and Qath teetered forward on stiffening limbs. She knew she would be seen for what she was.

Terror pins you. The thought came as she gazed up, tilting to register the height. A vast bulk moved in the webs. Moist beads drifted in a tingling cloud. Massive arched stoneworks gave the hushed air a pressing weight.

Qath began, : : Abbess, abysmal sorrow—: :

Do not attempt it. I see.

The looming structure worked with flashes of light, spanning the chasm with silvery swarm. Qath struggled to take it in. She felt a probing. Fine wires laced through the muddy inside of her. She dully sensed a phantasma dancing, spinning—and then gone, evaporated.

It is not Nimfur'thon that infests you. The words rang cold but they floated awash and welcoming in the Tukar'ramin's warm sea.

: : No. I fear some, some—: :

Cease. The weight you carry must be lifted by degrees. Not shrugged aside. Immersion in our Path will help.

: : I *know* the Path—: :

No myriapod can trace more than a branch or two of the Path, Qath'jutt'kkal'thon. Do not add arrogance to your burden.

: : I—: : The pressing fear welled up again and Qath sucked in breath to cry out.

**I see it. Know it. But you must

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journey through that mossing.**

In a pause which renewed her, Qath heard, **The Factotum will show you the Chronicle. Explore it. See the sweep of us. This will restore you.**

Qath left, stumbling on numbed pods, spiracles sucking and bristling in agitation.

Within the Chronicle, time engulfed Qath. Left moored in the mesh by the Factotum, helmeted, pinpricked in all her senses, before her gaze the vast story opened.

She knew the outlines, necessarily. The familiar images flitted by, in ancient incomplete sensoria.

Flat, shrunken multipodia labored every tenth day and rested the other nine. Their life was uncaring, a sweet gambol. Even aged myriapodia lounged amid the sticky strands, pap-gorged, basking slowly. The race spread over the homeworld and then, much later, to a fortunately hospitable neighbor. The sciences were numbed by the pervading slackness.

The podia had not always been this way; in early drawings fierce, long-extinct animals took the pincer in their throats, struggled, stilled. The ancients had cleared their world of such vermin. And then the long slackness came to the podia. But the challenge of the third planet they discovered—bitter, cold, swarming with toothed life—changed the podia. The slit-eyed spirit returned, and after came the Redeemers, and finally the discoveries that made sense of all things.

What is your concern? whispered the sensorium, knowing attention lagged. The Factotum was ever alert.

: : I . . . I am here because the Tukar'ramin . . .: :

That is seen. Perhaps you need a distractant?

: : I don't . . .: :

Some educational facet of the Chronicle?

: : Very well.: :

Qath was in too strange a mood, her mind skittering on the surface of something invisible, to digest any literature. She braced herself as the sensorium began, *Harnessing the Collapsed Stars*, and tried to relax. The introduction quickly shuffled through conventional lore about the nearly burnt-out stars. They imploded, their pyre a flash seen across the galaxy. The smaller ones left cores of pure neutrons. Spinning, their polar caps spitting out particles, they beamed frantic searchlights, pulsing steadily; galactic lighthouses. A useful source of energy. Once the spinning slowed to three *hextons*, the podia could approach. Teams of strandsharers blocked the circling streams of particles, dammed the energy, silencing the pulsar, converting it to useful purposes—

Without warning the thing came welling up from inside. Qath met the fear for the first time and saw its face in the images swimming before her. A nebula drifted, shimmering with the delicate pink of birthing stars. It was a backdrop to a spot where a pulsar flickered. Across the thin sheet of light oozed a dust cloud, blotting the

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nebular face, a precise image of the death that awaited all of the podia, all beings, everything. Nimfur'thon, first singed brown and then blackening, her flesh crisp and brittle, cracking away. Nimfur'thon was nothing now, gone. Qath felt sadness for her strandsharer, for the spirit that had quadded simply with her in the warrens of their birth-world. But that sadness was the mere skin of the beast that slouched below, the thing Qath could not voice to herself until this moment, as the dust-lanes blotted the nebula's glimmering. Dust. Darkness. All-swallowing death.

Qath felt a chill of dread, not for Nimfur'thon, but for herself.

Qath pressed for the Factotum.

Yes? Your instruction is not complete—

: : Forget that. I want the Chronicle again. The Interlopers.: :

The usual history was there, in abundance. How the Exodus began, once the race had seen the challenge and understood what the landscape of science implied: the holy cosmic view. How the Interlopers opposed the Synthesis. The debate. Efforts to bring the Interlopers into the starswarming community failed. They deflected arguments, refused to understand bald facts, evaded reason. Eventually they died out (why? the sensoria skipped over this point). Or, they fled, fled to become the Remnant. At last united, then, knowing the truth, the race went on to—

Yes?

: : The Interlopers—their teachings? Those are not mentioned.: :

That is not customarily requested.

: : I am requesting it.: :

Certainly.

A gloss of more history. Dates, places, facts—planets and eons, now all faded. Then, plunging on, Qath was suddenly in the midst of the Interloper's own era. Pale sensoria outlined the Interloper vision, quoted their texts. The death of the individual was a fact, they said, brute and unavoidable. There was no sense in the Exodus, the starswarming. There would be no rebirth for each of the podia. There was no hidden message in science.

> It is our station to live within laws that give us being, but offer of themselves no purpose or promise, no triumph as a species. The universe allows us a place in its systematic workings but only cares for the system itself, not us. Even this manner of stating the truth is misleading. The world outside ourselves is in fact incapable of caring. We exist as a random happening in a world which is orderly in its laws, but without any plan beyond the gravid workings of the rules of dynamics.

Qath recoiled, as though an eating strand had suddenly writhed and turned into a serpent. Here it was, what she had feared. Now it was substantial and unmoving, a solid chunk of history. Other podia had seen the same vast chewing abyss. The world was a rotten, hollow thing. One touch and it split.

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Qath's heart pumped erratically; she could sense each surge through a different tube. The sensoria went on. The Synthesis was refuted. The history of the Exodus, carved under a different knife, became unrecognizable. There was talk of religious mania.

But the Synthesis was *not* religion, Qath argued to herself, it was a *discovery*. Religions had come and gone before. None had caused the podia to rise as one.

But the logic rolled on, over Qath's objections. The images flared, one by one: spindly podia smashing nests, cutting strands. Interlopers gutted, wailing, and hanging to shrivel under strange suns, their hivethons taken to fuel the Exodus. The Synthesis spoke of rational podia seeking the light—did this look like the labors of reason? How could the Synthesis be so sure of its assumptions?

Qath snapped the sensoria off and yanked at the helmet.

You leave all these incomplete—

: : Yes, yes. So?: :

It is not done. No benefit accrues from—

Qath listened in silence. She remembered that the Factotum was, after all, a stunted podia from the far past, a mere few lobes salvaged for this use. Best to humor it. Then an idea came.

: : Surely, Factotum, surely,: : she interrupted. : : I am disturbed by the Interloper lies, that is the reason. But I have a query for you. Only one as old and wise as you can answer it.: :

A warming burr: *I will, of course, try to—*

: : Your other lobes—those which did not survive. Where are they?: :

My other—? I am not aware—

: : You don't sense something missing?: :

My earlier self, you mean? I . . . I do not know. Sometimes I remember doing young things, yes. But those parts are gone.

: : Gone where?: :

A . . . away. They are not functional.

: : Not alive? Not anywhere?: :

No, I think not. I would sense them if they were . . . I, I, this brings pain to me. Please . . .

: : Of course. Forget what I said.: :

Qath realized that the Factotum would take the words literally and erase the conversation. Perhaps that was just as well. The poor fractured creature could not deal with these questions.

Perhaps, Qath told herself grimly, no podia could.

Beq'qdahl clacked by, moving rapidly and well.

: : Confluence will begin soon.: : she called.

: : What?: : Qath, distracted by a robot resetting the sleeve of her injured leg, glanced up.

: : The confluence for Nimfur'thon, slit-eye.: : Beq'qdahl canted her forelegs back with easy grace, her thorax colors and fuzzed eyes rippling with wry humor. Eyelet hairs dilated out-

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ward in waves, to signify strandsharer fellowship. : :You have not forgotten already, I hope?: :

Qath burned with embarrassment. Whenever she thought of Nimfur'thon the persistent nightmare flooded over all other memories—bad enough that a close strandsharer was gone, but what the fact implied was far worse . . . Still, she should try to fix thoughts on Nimfur'thon alone. : : Of course not. Some mourn in private.: :

: : A point. I will see you, then : :

Qath decided to cover her confusion with a sly dig.

: : I have not noticed much public mourning, however.: :

Beq'qdahl caught the hint in the words. : : Meaning we all should do what you do not?: : She pursed her anal cavity to show the remark carried no sting.

: : At least I haven't been striving to transfer into orbital weaving.: :

: : So you haven't. A good idea not to. You are inexperienced.: :

: : Your eyes grow drool-dimmed. You mistake this crippled leg shell. I carry four pods, as you.: :

: : And have done so longer, I'm sure you will soon add.: :

: : The thought does leap to the lobes.: :

: : Very well.: : She settled into knee-cock, *rachet, rachet.* : : You think I overclimb.: :

: : You came here a quad. I spanned less area than you, it is true, but I did have four legs. I still do. For you to try orbital weaving before *I* do—: :

: : You know I had much experience at seeding the gaseous envelopes of the red giant stars. True, our technique was different—but we did work in free space.: :

: : *Cow labor*,: : Qath rattled out with sudden viciousness that surprised even herself.

: : Not quite. We plant the spores, yes. The plasma filaments which grow on the star surface froth up, spitting out starlife—waste matter, for them.: :

: : *Dung collector*!: : Qath smoothed her eyelet hairs and oozed red pap through them, to show lacings of jest.

: : An element of wisdom, there. The filaments live—technically speaking, though to me they are only arrays of field quantities, vector summed—and they shit upward at us.: :

: : Shit which you comb, cooing to them as you do it.: :

: : They spin off thermweb to us. Are we to argue about how it is delivered? The ancients fried many of themselves to develop such farming. It is the easiest method by far to make a Prime.: : Beq'qdahl fizzed an outgassing port in frustration. : : A slippery twine for hoisting oneself upward, however. No advancement.: :

: : That is how you came to have a mere four pods when you came here?: : Qath had suspected something far more inglorious and interesting.

: : Yes. Promotion comes slug-slow for thermweb farmers.: :

: : The Factors have their reasons,

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I'm sure.: : Qath said.

A pause. : :Qath, are you troubled?: :

She replied, sharply chittering, : : Why? You expect *applause* for your career as shitmonger?: :

: : No, just that your words say one thing and your cilia, your thorax spectrum—they say otherwise.: :

Fear darted through Qath. Could Beq'qdahl read what she truly felt? Did Beq'qdahl know? Qath started to compose a crushing remark and then thought better of it. : : I have only as many pods as you, Beq'qdahl, but I am still your senior. My thoughts are my own.: :

: : Very well. I hope your precious selfhood remains composed, even after I am promoted to orbital weaving before you.: : Beq'qdahl clattered her ossicles in jeering symphony, excreting bile juice from their seams, flooding the tunnel with an acrid tang. : : If we be rivals, let there be no pretending otherwise.: : She exited, clanking a rear waste port.

Qath brushed away a ratlike service robot which was polishing its handiwork. Beq'qdahl was a competitor, of that one could be sure. For a passing moment Qath had wanted to unburden herself to Beq'qdahl. That would have been an error. No one could help. But still . . . if she could find even a gesture, a word . . .

Stamping heavily out of the tunnel to try the fixed pod, ringing and clacking, she noticed a reference output in the ceramic wall. Something nagged at her, something from the simmering anxiety within. She punched for General Information, gave indices and scanned.:

> The Synthesis: (1) Realization that a continuity exists between inert matter, through the grand design of the early universe, and intelligent life today. Now accepted by all, this cosmic perspective may be seen as a culmination of all the ancient religions, though of course it is erected on a foundation of the scientific . . .

Continuity. That meant things went on. Stated so baldly, in austere and objective lines, the phrases had a certain power. A tiny crevice, but Qath took shelter there.

The podia assembled for the confluence in an ancient cavern deep in the hive burrows, one carved early in the history of the brood. The walls were smoothed by time and the scrabbling of pupa, and they reflected in watery images the mingling, chattering podia. Dani'vver appeared at the entrance of the confluence portal and issued the ritual call, syllables booming down from the arched ceiling. As custom required, the crowd ignored her and kept on making motions at the machinery spotted across the floor. They did no labor, of course—the devices were ancient, stiff from neglect. It was only necessary to appear to be working. The desired impression was somewhat undercut by the swirl of colors as the podia clustered around the frozen machinery, talking (a few were eating;

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the day waxed late). None wore the gray, rough work sheaths of a laborer. Instead, there were ballooned legments; rosy crescents of flapping headdress; fuzzed cilia; rainbow washes of sweet-scented pus that set off artfully inflamed eyelets; teased tracheae plumes; carapaces of steel-blue sheen; pearly castanets of animal bone, jangling from each legjoint of the myriapodia; fresh encrustations of mica or baked pumice; on those recently promoted, the gleaming leg they had earned, polished and bright amid the tangle of their tarnished pods; ringing, coppery antennae; huge tasks; pulpy and swollen bladders of those recently augmented with artificial digestive tracts; flashing quartz lens-eyes; sensors, glowing like jewels in oil.

Dani'vver's call again rolled over them and this time the podia answered, swarming up the laddered strands and into the confluence hole. As they creaked into knee-cock, Nimfur'thon's image formed above them. The traditional invocation began. A ringing voice thanked the laborers for quitting their tasks, to come and honor a fallen strandsharer. Qath paid close attention, though some others nearby buzzed with conversation. This distraction died away when the Tukar'ramin appeared on high, melting into being above Nimfur'thon's fading image.

Transmitting on several harmonics, Tukar'ramin's deep voice intoned the Verities. How perturbations of the Ylem clumped the balls of spinning gas, which in time flattened into galaxies. The collapsing cores of the young galaxies flared hot: quasars. The light of these birth throes reaches us across the universe, pinpricks of radiance. By the light of such burning beacons we make our cosmology. At the center of these galaxies lurk the immense black holes, holding in a vast grip perhaps a billion stellar masses. The holes spin and suck, spin and suck. Accretion disks form around them. Tidal forces grind stars into dust. Electrodynamic forces emerge. The inductive fields force great beams of particles out from the disks, like geysers. The beams ram through the parent galaxy and out into the great spaces beyond, radiating. This is the cause of the vast radio lobes in the sky: double-armed excretions of the black holes. These cancerous growths blow away gas and dust from the cores of galaxies. In such disrupted sites, new stars form poorly. Only the benign galaxies provide the mild conditions necessary for life. Thus we glimpse across the universe only the catastrophies. In the quiet, unseen, wheeling disks, the Verity goes onward. Stars bake heavy elements. Organic compounds thrive. Planets spin. Life struggles upward.

Qath became drowsy. The many legs of the multipodia rustled impatiently. Multipodia nearby sent covert chatter on their private bandwidths. The Tukar'ramin surely overheard them, but still droned on. The familar litany:

Life that was Nought mastered the

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energy resources of a world. The first Stage.

Life coming to Prime converted whole stars to useful purpose. The second Stage.

The race of podia were surely Primes now—this much they had risen. Their purpose was to become Spanners, the third Stage, to master the colossal energy sources of the galaxy itself. Such a torrent, used to signal across the gulf between galaxies, could send word of the podia to the entire universe. This was their destiny. The podia would be starspanners. The Summation, the gathering together of all in the universe, would follow.

—all strandsharers, near far, flat thin, sorbed and laced. All shall lick of it in company. When mind dominates matter at last and turns it to the purposes of the Spanners. The race to the entropy death shall be halted. Mind will rule. As the atoms of our bones and metals were cooked in the first stars, so shall we return to oneness with the universe and . . .

Something coiled inside Qath. In the spiral arms flaring with supernovae she saw not stars coming out of nothing, but instead black dust eating all, a relentless tide of filth that swamped the ember ruby stars—

::But what of *us*?::

Her voice shattered the Verities. The confluence ceremony fell into shocked silence. Qath discovered she had risen from knee-cock to full stature.

You have a question? That is proper, my strandsharer.

But no one ever asked questions in confluence, ever, and everyone knew it.

::Why do you say we will be rejoined in the Summation?::

All life will find rebirth.

::Where will we be hiding in the meantime?::

In waiting.

::Will we know it? *Know* we're waiting?::

In a sense.

::Even though we're dead? Like Nimfur'thon?::

It will be like sleeping time.

Above, the Tukar'ramin loomed vast and glistening, anchored to gossamer strands. Qath heard a muttering of discontent around her. But she pressed on.:

::All of us there, together?::

Information does not ever truly vanish in the universe, if we can bring an end to entropy. That is our aim.

::But we haven't ended it! We are only *beginning* to be Starspanners.::

Qath'jutt'kkal'thon . . . The Tukar'ramin lowered a proboscis encrusted with ferrite sensors, peering. Her cilia rippled with concern. **It is better to think of the Summation as something far larger than yourself. For such it is.**

::Of course, I know, but—::

We live on in the sense that our works live. What we *are* lives. Our vector sum abides in the universe forever.

::But are we *conscious* of it?::

That, I think, is unknown.

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::But it's the whole point!::

No, I do not believe it is.

The reduction of the center of the matter to, to an *opinion*, stunned Qath. Without this peg the edifice collapsed.

It is the essence of us which propagates.

Several of the myriapodia sent discreet low-frequency signals to Qath, urging an end. Other podia murmured and rustled.

Qath felt a sudden rush of embarrassment at being so exposed. They were all mutely accepting, all of them. None truly believed.

This has proved to be a blossoming exchange. Are your quandaries resolved?

:: . . . Yes.::

I suspect you are somewhat more disturbed by Nimfur'thon's passing than the rest of us. Know that we understand.

::I . . . I know. ::—then the ritual of ::I give thanks.:: Qath returned to knee-cock.

Podia nearby pinched their cilia in disapproval. Beq'qdahl openly jibed. The *ufalum* passed from pincer to pincer. The confluence buzzed with muttered remarks; Qath, mind aswirl with doubt and embarrassment, paid them no attention. When the *ufalum* passed by Qath took a strand numbly, engorged it, and deliberately began to pull the sticky wad into strings. The manipulae inside her mouth tugged the sweet filaments and spread them into sheets, expanding the surface area. Fine-boned manipulae pressed these against tasting buds, to heighten the sense. Qath sat and worked her mouth, as did the others.

The confluence came to an end with singing and smacking noises as the last of the *ufalum* was devoured. Qath made a show of clenching her thorax but no matter how thinly she pressed the *ufalum*, somehow Qath could not swallow, could not truly eat.

That evening she podded away from the floating, shadowlike hive and journeyed at random among the unslashed hills to the north of the Syphon. Tomorrow she would return to the ferment of work, but now something different drew her out of the secure warrens.

The rolling hills were mild. As she passed over them, the land rose and fell regularly, as though this planet were breathing. (If so, Qath thought in her distraction, the world would begin to gasp its last quite soon enough. And inexplicably, the image disturbed her.)

A roof of clouds drifted overhead, bellies bulging blue with rain. A wan glow from the setting sun drenched the landscape in oranges and reds. A herd of animals grazing caught sight of Qath and scattered, pell-mell. Even for animals, they seemed stupid and graceless. To think Nimfur'thon had hesitated a precious time too long, out of concern over these base creatures! This was a crude planet, incapable of hatching even Noughts in its scum of sea and sky. Had there been Noughts, mere planet-masters, with their crude

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devices—at least then the podia would have had something to absorb their time. The hive could be successfully breached by some types of Nought weaponry; that had been amply proved in the past. So Qath and Nimfur'thon and the other younger minimapodia would have been kept busy clearing the area of Noughts—perhaps even entering Nought cities, preempting their crude weapons with flame and sleets of high-energy particles. Then Nimfur'thon would never have concocted the absurd jape of glimpsing the Syphon from close by. Nimfur'thon would have lived. The blackness that Qath now knew to be everywhere, behind each apparently solid object, would not have swallowed up Nimfur'thon. As it would, inevitably, suck down Qath, the Tukar'ramin, everyone, everyone and everything. A vile joke of continuity.

Qath plucked up a boulder in irritation and flung it skyward toward a distant herd of dull-witted grazers. The stone smashed great holes as it bounded through them, felling a few. Smaller animals hopped in panic from their warrens. They melted into the shadowed dusk and Qath turned, weary, back to the floating mountain that was the hive.

The Syphon lanced skyward again. This time it did not snake sideways. No burning lash fell on the focusing lenses as the metal, streaming golden in this star's blue light, gushed out. The podia took special care with this first successful firing. They would have to repeat the exercise twenty or thirty times before abandoning this scrap of a world, each time a bit more difficult because of the shifting pressures below as the planetary mantle readjusted.

Qath took refuge in the bustle of work. She volunteered for excess time at the feedback-stabilization monitor. Canted forward to sense the rippling green display, integrating differential inputs, she felt the pressing hollowness of the world lift. If there was no redeeming facet in things, at least there was this: a blur of activity hid the fact that activity had no vector of itself.

Once the Syphon steadied its rush of core metals the hive lifted further from the ground. Qath, off duty, watched from a viewing blister. The ground below heaved and broke, spurting fountains of dust. The land groaned. Pebbles rattled on the blister's underbelly. Animals stumbled in panic as hills slumped, rock split, pits opened beneath their feet. The crust, unsupported by the Syphoned core, collapsed inward.

Qath felt her resting strands quiver and she turned, away from the chaos outside. Beq'qdahl nimbly enveloped herself in a webbing.

::A good show.::

::Yes.::

::I think we'll start mining tomorrow.::

Qath allowed herself a glance at the larger mass suspended next to her.

::You're looking forward to it?::

::Isn't everybody? It's a chance to

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show what you can do on your own.::

Qath had not thought of the mining that way, but Beq'qdahl's self-assurance made the point obvious. With each sucking of the Syphon the crust churned, exposing fresh seams of rare minerals. Many minerals were needed in the thermweb weaving, now going on in orbit. To thread the great bands of cold-formed nickel-iron required bonding pastes and weldings, so freighters lofted a steady stream of mixed materials from the surface. And the podia had to find the richest seams, upturned in the collapses. All who could be spared became prospectors.

::It is boring work.::

::Of course it is. That is why few do it well.::

::I prefer focusing the Syphon.::

::That's just puzzle-work. No real zest in it.::

::It is *intellectually* more difficult to—::

::Oh, never would I question your intellectual credentials.:: Beq'qdahl dipped her proboscis sarcastically, impaling on it a burr of spitfood. ::Particularly after that brilliant cross-examination of the Tukar'ramin you performed.::

::I was seeking some answers.::

Qath bristled cilia.

::To dumb questions. What does all that matter?:: Beq'qdahl plucked a mite from a moist slickstrand.

::It is everything.::

::Talk, that's all. We are here to *act*.::

::But what is the purpose.::

Beq'qdahl leaned closer with easy grace, her hydraulics wheezing.

::The purpose, slit-eye, is to get into orbit. To *weave*, not hug the ground like a grub.::

Qath framed a reply, but Beq'qdahl turned in her smooth, fluid way to watch a geyser of rock and dust spew toward the hive, rumbling. In her casual rippling of nested brown carapace Qath suddenly saw that Beq'qdahl would be a success. That Beq'qdahl's smooth, successful uncaring manner came forth naturally because she was in touch with deeper wellsprings, she sensed the way things really were. And in that clear world the Synthesis was talk and the Summation a promised sugar dollop meant to quiet children, not a thing podia took seriously for long. That world was real. Relentlessly real.

Qath was gingerly setting down when the call came. She played a blue-white rocket torch across the rock to test its firmness, then thumped down awkwardly.

Gathering Call, came the beep, slicing through her concentration. She crunched over crumbling slag and surveyed the silvery-green streaks she had detected from above.

Gathering call.

She slipped a needle into the flaking silver-green, measured, and clattered her ossicles in frustration. The stuff wasn't *palazinia*. Finding a lode of *palazinia*, the rarest of the bonding pastes, would have been wonderful, a coup. This scrap, glinting falsely—

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Qath kicked at it—was worthless.

Gathering call.

She answered, dreading.

Rendezvous 974-603-7298. Beq'qdahl has found a deep seam of—

Savagely she clicked the message off. Another feat for Beq'qdahl. This was the fifth important find since the prospecting and mining had begun, all Beq'qdahl's. Most of the other podia were kept busy mining Beq'qdahl's discoveries, leaving the field clear for Beq'qdahl to find more, to stand out even better. Qath had pondered giving up prospecting—she wasn't good at searching; she moped and rambled when she should scuttle, ferretlike, poking into every cranny—and becoming a miner. But something inside made Qath keep on, trying to best Beq'qdahl. She could not yield the ground so easily. If only—

Qath'jutt'kkal'thon. Summons.

::I was delayed. Am proceeding to—::

No. Return to the hive. To the Tukar'ramin.

Down the slippery strands slid the Tukar'ramin, a great glistening mass of polished metal and carapace. Gusts of warm well-being spread through Qath as feelers stole into her mind, sensing all. Nervous, jittery tensions smoothed away.

Rejoice, small one.

::All celebrate, in your presence.::

No formalisms please, they tax the mind by seeming to mean something. Rejoice, because you need no longer slough the crumpled land. I know you dislike that.

::I have been so . . . obvious?::

A spilling, gurgling closeness answered, rich in joyful memories of birth. The Tukar'ramin drew Qath nearer, washing comfort and forgiveness.

Your doubts drag at every step you make.

::I have kept to the task.::

The words came out more stiffly than she intended, but Qath clutched at the phrase out of a sense of dignity.

Must you go always so sober-suited?

::I . . .:: she hesitated. How to tell this most enfolding of all creatures that the snug universe was a vortex, sucking them all down to nothing? ::I am a young adult, a mere five-podder. We are by nature more solitary than the aged.::

But Beq'qdahl is solitary, too. Alone, seeking rare soils. Her pods do not shamble as yours do.

::We each have our solutions.::

But you are none of you alone! Faint, chiding exasperation. **We are bound on the great, final task. The thermweaves we spin in orbits around this star will clasp firm its burning energy. Thus gathered, we can use the tamed power to communicate with other Spanners, in other galaxies.**

::I fully perceive this. Yet—::

I lick you do not. We span the galaxy to bring *meaning* to matter. Not simply within our own minds—the castles of beseiged reason—but in the stars themselves.

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She made the Sign.

Qath shuffled, not knowing what to reply.

I sense your unease remains.

Qath sent a sharp command to her podding subtask brain, willing its nervous dance to cease. ::I, I have no vector.::

You will regain it, I am sure.

The Tukar'ramin paused as though she were searching her files. *How to tell her*? Qath thought. How to say that this warming theology could not touch the cold core now condensing inside her? The Tukar'ramin's mellow world did not know of such things.

This is the answer, here. On her great wrinkled hide flashed a code number. **We will encrust you. A small addition for your new task.**

::The prospecting—::

Is not spiritually fitting for you. We are lacking labor in the hive itself, due to the mining. Here I will sense you better, as you work. There—you have the code? Apply to the Factotum and be encrusted with your new tool.

Qath knew her time of audience was up. She skittered sideways, eager to discover what liberation from prospecting awaited. And an encrustation—! Next to promotion, which would mean an added pod, encrustation was the highest tribute to a podder. Qath could preen in the warrens, displaying her addition without baldly announcing it. A plus, definitely. Yes. Her spirits rose.

Qath clattered past Dani'vver on the way out and made haste to the nearest terminal. She beeped the code number and awaited the news jingling, her servos humming.

The screen flickered ivory. An image of the new tool formed.

Gorge rose in Qath, an acrid bile that rasped her thorax. Swimming before her was a wall stapling gun. A simple, brainless tool for fastening masses to the rough hive walls. A task for a simpleton. An encrustation so low as to be an insult.

The days passed with an ache in each hour. Qath tacked machines and crates to the hive walls, in the company of a rabble of robots. The small creatures squeaked and jibbered in their stuttering computer talk. Qath felt a stab of embarrassment whenever an acquaintance happened by, but in time this faded. She was laboring, like any of the podia, and gradually she came to feel that this was her rightful station. Facts had their own hardness, but one could sleep upon them. Qath did not mind the studied way some myriapodia now ignored her conversation. There was always someone to talk to, anyway. The myriapodia were distant and boring, in truth; they cared only for their many mechanical jewelments, and how to acquire yet one more. Eons ago the idea must have seemed a good one, Qath thought: augment the podia as they aged, to use their experience and shore up the stiffening organs. But now these encrusted mammoths preened more than they worked. And the Qath they snubbed, passed without seeing as she labored

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among brainless robots, that Qath knew that these bright myriapodia would die no matter how many stringy muscles and clogged veins they replaced.

The old were by nature and instinct more gregarious, Qath told herself as she returned alone to the communal webbing, down the inert gray arteries of corridors.

She passed a gang of miners and prospectors. One called out.

::Come, pay tribute!::

::To whom?:: Qath asked, tired.

::Beq'qdahl! The Tukar'ramin has newly six-podded our friend!::

::For what?::

::You jibe, wall-tacker.::

::No. For what?::

::Prospecting, of course. A rich new seam of *palazinia* today.::

::I see. A lucky find.::

::More than luck!:: A knot of quadders surged through the rough-rock tube, roaring, addled, ::Craft! Spiracles that sniff out rarity. That's what we go to celebrate!::

Beq'qdahl came into view. Three podia escorted her. The fresh leg gleamed silver under the phosphors and Beq'qdahl bowed to them, articulating well. But her eyes drifted randomly, fogged, unattended by a saturated brain. ::Come with us, Qath'jutt'kkal'thon.:: Her voice was thick from excess.

::I am rather tired . . .::

::Don't you *want* to celebrate?:: One of the quadders shouted. ::Beq'qdahl has been double-promoted, *cicada*. A rare honor!::

::I realize.::

::You're buzzed that Beq'qdahl is now a hexpodder, while *you* remain with four. That's *it*, isn't it?::

::I am really not in the mood—::

::Grub! Rotten *cicada*!:: The wobbling quadder lurched toward Qath, threatening.

Qath skittered aside.

Another farted sourly in contempt, an acrid yellow cloud. Beq'qdahl was dazed, studying the grainy stone walls.

Qath ducked down a side passage and away, to the moist gossamer communal bedding to sleep.

Sleep.

Yet sleep was fitful and laced by hot lightning behind the eyes. Qath tossed and clutched at her smooth bed weavings. At times she awoke and then it was like the long Dreamtime when they journeyed, at far below light speed, to this star system. They hung in swaying pearly sacs and voyaged through the notsleep, bodies slowed, minds floating among visions best forgotten later . . .

Just before dawn the distant sounds of Beq'qdahl's celebration finally died away. Qath expected deep sleep at last but instead wakened soon with tingling palps. She had seen a vision. The Tukar'ramin, shrunken and old, lecturing. Not the enduring, enfolding Tukar'ramin she knew, but an aged and dottering old podia who repeated the rote wisdom of the past. Despite the technical magic that let the Tukar'ramin span the gulf between minds, and heal, she was still an

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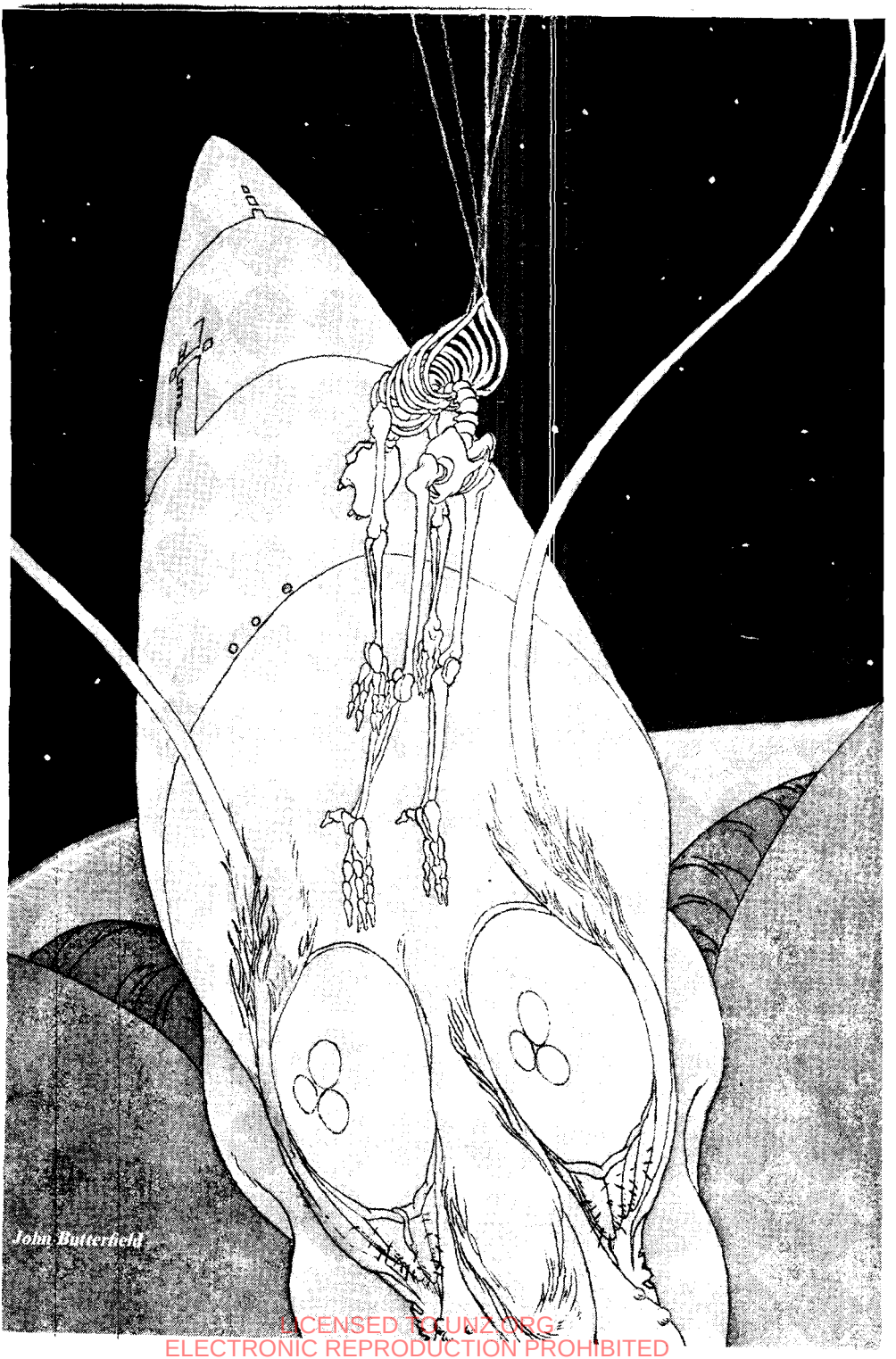

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ancient podder, no more. The Tukar'ramin had been describing how the Interlopers and their heresies were washed away by the starswarmers, until the few remaining fled. Then the Interlopers altered their bodies and became the Remnant. Qath said, in the dream, *You knew the Interlopers, but can you be sure they were wrong*? and then the Tukar'ramin, shocked, fell crashing into brass and ceramic and gristle and withered bony parts, thorax and antennae rolling clattering on the warren floor, she fell and fell endlessly, residue of the crushing weight of time.

The Syphon sucked again. And again the planet's husk cracked and spit dust. It was fortunate that this world had no major oceans, or a different fraction of the crumpled crust would have been submerged with each Syphon firing, impeding the mines. That fact had helped select this world for the thermweaving. It overrode the absence of moons, whose ripping apart would have provided convenient building materials. Instead, freighters boosted rock into high orbits along with the rare minerals, and the weaving continued. Already a small fraction of this blue star's light had been captured. When finished, the weave would be only a framework, of course, for later expeditions. They would render the planets into light-sopping materials—a tedious task—in preparation for harnessing the star's total flux.

By the time that happened, Qath knew, she would be long dead, and the dream of starswarmers touching between galaxies in the Summation would be, for Qath, dust. The only remaining mystery was why the others did not see this. Or care. It was one thing to know in an abstract way that one day you would die, and another to wake in the night and feel your heart thumping. To delve into your subtask brains and feel the prickly oxygen entering bloodstreams, the slow sluggish rebuilding of tissues, the dull orange burning of stored calories . . . and know they will cease, you will plunge into blankness.

With repetition these moments grew familiar and lost some of their bite. Qath began to see herself as a simple being, humble before the brute facts of living. She labored with the ratlike robots. She stapled bulky equipment to the rock. She followed orders and kept to herself. From murmurs of transmissions in the hive corridors she overheard more talk of Beq'qdahl's successes. *Beq'qdahl is rising*, the myriapodia observed, as though Beq'qdahl were a confection baking, puffing itself up, and they were indirectly the cooks. To Qath these matters no longer stung. Thus she was not disturbed, when work teams were reorganized, that Tukar'ramin ordered her to accompany Beq'qdahl as an equipment carrier.

Ahead rumbled Beq'qdahl, legs scrabbling on the rocks. Her crescents of phosphors made a small splotch of day amid the night. Qath lurched

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behind, jumping at each tremor of the rock for fear that another shifting of the crust had begun. Overhead the stars were eyes staring out of a swallowing abyss.

::Hurry. I want to probe this outcropping.:: Beq'qdahl transmitted only clipped, efficient messages.

Qath labored forward under her load of special sensors. The Tukar'ramin had given Beq'qdahl a complete analytical station, so that tests could be made in the field. The components were bulky. Qath also carried Beq'qdahl's extra boosting rockets, for escape should magma spurt over the crumpled hills.

::A differential spectrometer.::

Qath supplied it. Dawn broke as the sun ripened behind thinning clouds. Qath thought of Nimfur'thon and their gambols on these lands, then sprinkled with green. A very long time ago.

From behind a tilted shelf of rock ambled a flock of animals. It was surprising, Qath reflected, that they had survived the land's heavings. The next Syphon firing would surely end life on this world.

Something whined off Beq'qdahl's high turret.

::Do not jostle me.::

::I did not.::

::I said . . .::

Beq'qdahl saw the animals quickly spreading among the shattered boulders. Something thudded into Beq'qdahl's quadflank. A pod jerked in spasm.

::They are throwing pebbles?::

::No. Those are weapons.::

Qath felt a flare of hot pain. ::High velocity.::

Another shot sang off Beq'qdahl's bronzed turret.

::These are more than animals.::

::A reasonable hypothesis.::

::But the Tukar'ramin said there were no Noughts! No civilization. No artificed works.::

::So she did.::

Two quick bursts caught Qath in the side. She drew up a battered cone and felt with her palps. A salty pus oozed forth.

::Evidently the inspection was cursory.:: Qath said evenly.

::Miserable Arachnida! These have *weapons*!::

::Yes, with considerable momentum density, as well. Simple, but—::

Beq'qdahl's shrill cry pierced the air. Her fifth pod split ripely and belched a foul smoke.

::I am injured! Injured! Help me to boost.::

::A minor breaching. Your waste system has ruptured.::

::Give me the extra boosters!::

Qath abruptly pitched forward. Her rear bulkhead puckered around two steaming holes.

::Off your knees! The boosters!::

::H . . . here.::

Beq'qdahl strapped on the blue cylinders. Small pockings and pebbles rang on her carapace.

::When you are above these Noughts . . .:: Qath spoke slowly. ::. . . sweep the backwash over the ground. The flames will—::

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::Maneuver where they can shoot into my underbelly?:: A harsh laugh. ::You are a grub.::

::Stay, then. We can perhaps ride over them and, and crush—::

::Flee, fool! This is not our task. Clearing of Noughts requires weapons.::

Beq'qdahl's infrared antenna wobbled and sheared away with a grating noise.

::You have the extra boosters.::

::I will go ahead. To summon aid. You . . . you boost as far as you can and, and wait.:: She finished hurriedly. Qath felt a stabbing gouge in her third pod. The gray animals—no, Noughts, she corrected herself—were nearer. They were fanning out. Metal glinted in their small feelers.

When Qath glanced skyward again Beq'qdahl was a yellow dot arching toward the distant hive, half the planet's diameter away.

Qath turned to study the Noughts. Small pellets went *snick* and *ping* on her skin. She hoisted her own boosters and locked them into sleeves.

Something caught her attention. As she articulated an arm forward, the stapler gleamed in the lancing dawn sunlight.

The stapler, which drove forked brackets into the hive rock.

Qath made ready to spark the boosters, and stopped. The Noughts could follow. When the booster fuel was exhausted Qath would have no maneuverability. But now—

Qath turned. She faced the enveloping tide of Noughts. There was something in her that wanted this.

A palp fractured as shards spun away. Qath watched them tumble, copper filaments that winked. She raised the stapler and sighted along it with three eyes. A Nought moved into the center of focus. It was a gray dab against a background of broken rock. Qath squeezed and the staple sprang away with a jolt. It missed. The Nought still ran forward. The small creature brought up a metal tube. Qath noted the precise spot where a rock was puffed into dust by the staple. She corrected her aim. Fired. Another miss. Qath felt an odd calm steal over her. A series of banging impacts tugged at her arms. Steadily she calibrated and aimed. The staple snapped away. The Nought vanished, falling from view into a gully.

Qath aimed for another. The gray target bobbed and weaved. The staple, when it hit, sheared the Nought in two. The ground around it was spattered with dark stuff. Qath stepped forward. She brought down two more, with three shots. Their high, frantic calls to each other increased. Many ducked behind outcroppings in the jumbled field, screaming. Their weapons still peppered Qath. The stings nicked away at her concentration.

They were crowding in now, skipping like mites from one shadowed refuge to the next. Qath calibrated again and ricocheted a staple off a ledge face. The splinters of metal bit into two hiding Noughts and they sprawled to earth.

Her side caved in. She lurched side-

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ways. Oil bubbled from her leg; a remotely actuated hydraulic cylinder did not respond. Her lenses fogged. Oxygen processors rasped. *Here it is* Qath thought. *I have met it*. Blackness closed in.

Drifting.

Swimming.

Darkness. Slow, slow.

Yet time ticked on.

In her blurred sensate universe Qath felt a brush of air, like the plasma wind which stirs the banks of dust between the nebulae. Watery images returned. She oxidized sugars with nitric acid, splitting open her internal mucus pouches to hasten the mix. A sweet dollop hydrolyzed in her mouth. She strained—

With a gathering rush the boosters fired. Yellow columns sang under Qath as she surged up. A cold fierce joy burst inside.

She landed halfway across the ruined field. The Noughts swarmed from their hiding places. Qath set herself and calibrated.

Aimed.

Ejected a rain of forked staples. Clanking rumbling surging she moved, boosting again, maneuvering, aiming firing aiming firing. The dabs of gray exploded. Guts spilled on the crushed rock. A chill fever came over Qath as they fell under her hail of staples, screaming and rasping for a last suck of air. Qath pushed across the field. Their peppering slowed, ceased. She swiveled and searched out the few gray spots remaining. They cowered in their hiding holes, bleating in fear, little better than animals. Each became a small detail that Qath settled with the quick stutter of the stapling gun. Each ended with a little cry, as though they had never before this instant seen what awaited.

When the last was sliced through, Qath stood alone, gasping, her mind fuzzed. She attached a line to a

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In times to come

Many moons ago, Harlan Ellison gathered several planeloads of the best science fiction writers alive, and displayed them for ten consecutive Tuesdays before a large and appreciative audience at UCLA's Westwood Campus. One of the many things the writers did was to create—before the goggling eyes of the onlookers—an alien planet, complete with ecology, natives, social systems, *et* several *ceteras*.

Well, you know how writers are. They went out and wrote stories about that alien planet—variously known as Medea and/or Harlan's World. We will publish three of those stories. The first, "Swanilda's Song," by Frederik Pohl, will be in next month's issue. Later issues will see stories by Poul Anderson and Frank Herbert, about the same devilish world.

Our cover story next month will be "The Wind from a Burning Woman," by Greg Bear; one of the best novelettes we've seen in some time. The cover illustration is by Mike Hinge.

We'll also have the second installment of the Robinsons' "Stardance II," and as much else as we can squeeze into a bursting October issue.

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Nought body still in one piece and hauled it up for better view. In the sudden silence the driving servo scratched. Her joints trembled with strain. The body turned on the hook. Abruptly Qath saw something else beyond the Nought. Through a break in the roiling, dark clouds a few stars still winked. There was something like a fungus lacing the fine points of light. A gray lattice. The nickle-iron gleamed dull and strong. Some strands were nearly complete, knotted at the intersections by pearly bonding agents. It was the first time Qath had seen the thermweb. She gazed upward for a long moment. Soon a red cloud blew across the spot.

Qath turned her attention back to the thing dangling on her hook. She plucked at the gray skin. Filmy, it tore away. The skin shucked off, much the way this world would soon become a husk. The Nought slipped free. At first Qath saw only the gangling appendages with their awkward, splayed ends. Two for walking, two for manipulations. The joints were slight, surely not capable of standing very much stress. Yet as Qath studied the creature she saw how the wrinklings and knottings of its skin wove together, telling how the thing lived. Patches of curdlings at the midjoints of the shorter pods, evidence of wear. A swirl of funguslike growth near the eyes, to cup warmth about the small brain. Another hairy patch, lower, to shelter a tangle of equipment. Qath traced the fine pattern of fleece that wove about the body, following what she could see were flow lines water would make as it passed over the skin. A beautiful design. This Nought was a swimmer, then. Yet it walked, also, after a fashion.

Qath clamped the head and turned it until a click came. She sent a subsonic hum along the body. With care she lifted the skull. The skeleton came free, sliding up out of the meat. To Qath this gesture brought into the air a fresh and wonderful vision. The chalky bones were not crude and heavy. They seemed delicately turned, fitting snug together, thin where waste would slow the beast, strong where torques and forces found their axis. The center was a fine-spun cage of calcium rods. Ribs. They blossomed into a brittle and precisely adjusted weave, a song of intricate design and wonderful order that Qath could hear trilling through the webbed intersections. Yet this Noughthing was a pest. It crawled on the ground and probably never noticed the stars. Its crude weapons were barely better than the tooth and hoof of animals. Qath spun the skeleton, marveling at it. Inside her a chorus swelled over her weak, doubting voices. She swept aside the bleak landscape of small-minded logic. Here at last was the truth made manifest. Qath's faith returned. A universe which spent such care on loathsome, useless Noughts surely could not make the whole drama pointless by discarding it all, by letting blackness swallow everything, by letting Qath'jutt'kkal'thon ever finally fail, fail and die. ■

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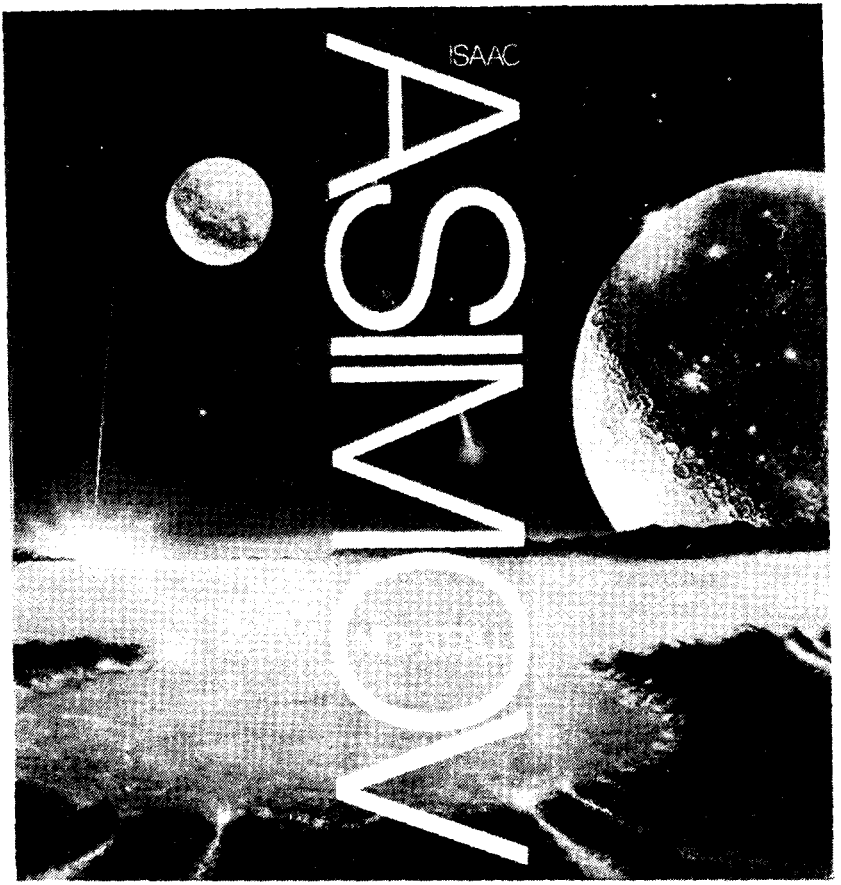

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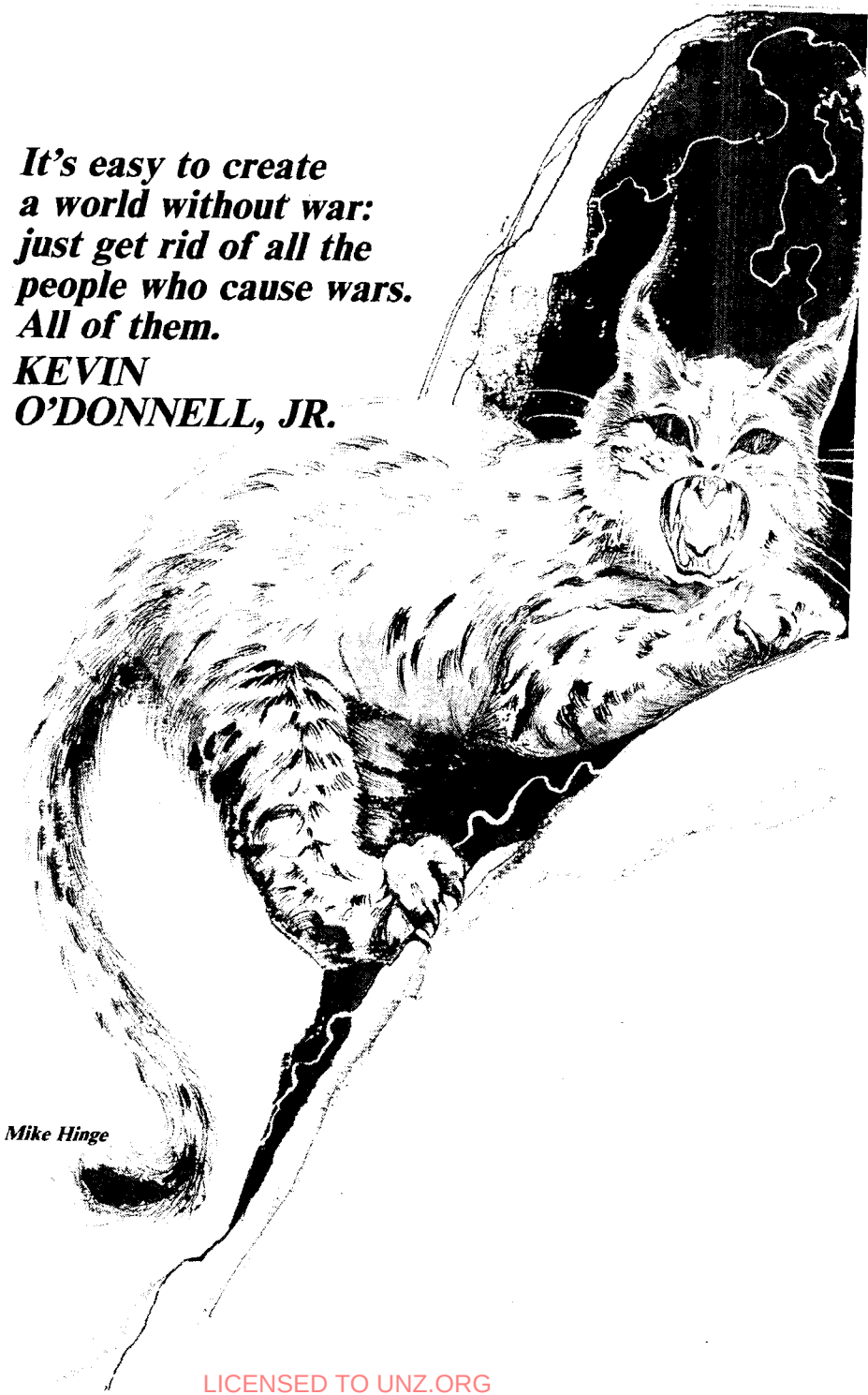

Mike Hinge

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stalking the timelines

There is no sky. More hills than Korea, though, peaks without ridges, jammed together like broken cones in the trash bin of an ice cream store. Cliffs a meter wide and a kilometer high. Twisty, narrow mobius-strip valleys. You could lose a regiment here in a minute, and spend a century hunting up the last man.

Nothing grows here. Forest green, woody brown, even mushroom gray: all strangers, *personae non gratae.* The only signs of life are myself, and the other shaggy slopescat reclining on a ledge high in the air. It watches constantly; its cross-slit eyes follow my every move. When a fold of land is about to engorge me, I can see its ears perk even sharper, its nostrils flare even wider. I wonder what—or who—it could be.

A wind blows out of the past, preternaturally steady at each spot, but variable, whimsical, when I move. It reflects, I think, the multitudes of times and choices . . . here an eternal spring breeze, there a perpetual hurri-

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cane . . . constant in any given location, but my restlessness gives it free rein to be fickle.

Squeezing between two giant outcroppings tortured into the shape of brain coral, I brush away the dust with my paw. There must be a centimeter's worth. Yellowish, fine-grained, it's beveled time, and the wind never disturbs it. The wind refuses to reach down here. Which at least keeps it out of my eyes.

The ebony clay squirms with lines that branch and branch and branch, like an unpruned family tree, red lines and silver lines intermingled, though here they're mostly red. Up a ways the silver dominates, and chokes out the crimson.

Peering closer, whiskers flat against the clay, I find a red one, my lifeline as it were. *Pop* and a single claw of gleaming ivory leaps out of its sheath. Then, carefully, I jab the claw into the ground, pinning down that thin red thread . . .

June 29, 1978

I rolled off my cot in my skivvies, dog tags jangling around my neck, crossed the small dark room and opened the door to the barracks. The low-voiced crowd of near-naked men didn't notice me barefooting up to them. I squinted over their shoulders and saw the writhing forms on the wooden floor. Nighttime and shadows cloaked them, but it looked like Jenkins and Vino Vinny were strangling each other.

Damn. If it'd been daytime I could have let them go at it until one of them needed saving—let them both get it out of their systems for a while—but in the dark can't nobody see when a face turns purple. "Break it up!" I roared, making a path in the crowd with my arms, like a breaststroker does in the water. "Break it up!" A couple seconds later I had one neck in each hand. I picked them up, and shook 'em some, then pushed them in opposite directions. They stumbled off willingly enough, like they usually do when it's just bad temper that started it, and at my growl the onlookers headed back to their cots.

I didn't put them on report—I couldn't really blame them. There wasn't much else to do in Djibouti except booze and whore and sweat. Godawful place to do a tour in, even if our presence was supposed to be keeping the genie of World War III in its bottle . . .

I twisted my mind around.

There is no sky, just the jumbled underside of another continuum. The light wells up out of nowhere, everywhere—I see with eyes designed for this slope and these eyes see nowhere else. They swivel till they find the other cat, who's stretching, yawning, pink tongue curling up out of its toothy mouth. I wig-wag my tail at him; he—she?—yawns again. Something in his attitude is hostile.

Prowling, wandering across time, its sawdust crunchy beneath my wide paws, I look for another likely line,

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another parallel world to inspect. My territory is a vast delta, narrow downpast, broad upfuture. Beyond it there is nothing—or, to be more accurate, there is only itself. One step into the mist at the arrow piercing the past takes me out of the mist upfuture; a plunge into the nothingness over *there* brings me bounding out over *here*.

I never suspected, when they sent me to Yucca Flats in '59, that this sort of thing would—or even could—happen. Apparently the fireball thirteen kilometers from the gooseflesh on my spine burned some kind of tether, and now . . . I'm a timewalker.

It came to me first in a different delta, when the Huey went kablooooie! and the green rushed up at me, opened its leafy maw for me—caught me in a fork of brown twenty-five meters above a greasy slither of weedy water. There were orange flames on my flak jacket; dangling upside down, I couldn't beat them out. There were black pajamas in the jungle below, laughing, pointing, torturing me with their slow-motion loading . . . it was not a good place to be in. I discovered, semiaccidentally, while twisting and jerking and slapping at my balls with blistered palms, that I could get out of it. That I had already gotten out of it. That I was . . . here.

My claws pockmark the ground—stabbing between the years, pinning down the days as a housecat does a mouse . . . thus do I read the clocks of infinity; thus do I re-enter real time.

November 12, 1988

Another week and I'd have done my thirty. Big deal. Wasn't nobody going to let me retire, not then, not in the middle of the Battle of Fort Worth. Forty-eight years old. Too goddam old to be leading a recon patrol behind enemy lines. Neck prickled and we went down! splash! stagnant water in the bottom of the culvert and upstairs a *Barrooomph*! as the shell went off.

Where the *hell* did they get those night glasses?

And the tanks.

And the planes.

All my goddam career I'd been told, don't worry about the next one, as long as we control the air we gonna win . . . always assumed we *would* control the air . . . how many Cubans got wings *anyway?*

A MIG flashed overhead, and rows of leaping dirt marked its strafing . . . small consolation that it flew too fast to be really effective against infantry . . . what the hell had gotten into those Meskins?

We snaked our way up out of the culvert, bruising our bellies on chunks of roadside concrete, alerter'n hell because we'd been warned three million men were coming at us, and those were only the *combat* troops . . . I spread my guys out, we were all scanning the horizon with our own night glasses and scopes, and goddam if the south wasn't just bristling with soldiers, with rifles, with campfires . . . called it in, told 'em they could hit anywhere in Sector 29 and be sure of doing some damage, and they didn't

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say nothing, there was just this long, embarrassed silence, like they were trying to figure out how to say that the Meskins has just bombed our artillery into tin cans . . .

Twisted out of then in a hurry.

There is no sky, no sun, no moon. They aren't necessary—they wouldn't fit in—their physics couldn't coexist with the physics of tweentimes—but to an old Army man they could be comforting. Just to glance up and see their familiar patterns, their homey shapes . . .

I claw my way up a needle, hearing time's bells ring every time I puncture the subsoil. The wind helps me, the wind comes up from underneath and pushes me. Be sheer hell fighting down against it, though . . .

Maybe I won't have to. Maybe up top I'll find what I'm looking for.

I've always been a soldier. Always and everywhen. Damned if I know why, but every world I've dug into has me in uniform . . . I'm the perfect noncom, in time. Not a stereotype: I don't drink, never paid a whore, don't even own a deck of cards . . . spend my time reading—mostly news magazines and books on political theory—taking whatever courses are offered at whatever post I'm stationed—in a couple dozen parallel worlds I've got PhDs, that's right, *plural,* as in several; you can do a lot of studying in thirty years' service—sometimes I'm a father and a husband; other times I've been too busy . . . but in all the lines I'm big, and tough, and smart enough to know how to take good orders and not hear bad ones.

Gotten me in trouble a few times—I've found myself in jails, in stockades, once even shoulder-blading a bullet-chipped wall (that was a tormented timeline in many ways)—but I have my ethics. I will not violate them for all the brass in all the worlds . . . I will serve, fight, die—but I will not be a Calley, or any kind of goose-stepper.

The other cat, still on his ledge, snarls across the abyss at me. He's telling me to get lost, to go scratch up another acre of delta . . . he doesn't like my nosing around here, though, he can shimmy up this needle and goddam well throw me out.

'Cause maybe up here is the place where no one pressures me to break my code. Maybe up here's that anomalous line that doesn't need soldiers . . . could that be what did it to me? Everywhen else I been, I *knew* I was needed in uniform—me and a thousand or ten thousand just like me, under all the flags. Without me and my kind, the killers would rule, or the idiots, and the one'd bring death to whatever innocents they declared to be the enemy, and the other would rain ruin on their own . . . it's the scarred veterans, along with the nukes and the cruisers and the rest of the hardware, who keep the peace. We're the difference between an Army and goons in khaki.

Bite the dirt, fangnail. Find me a place that don't need me.

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May 23, 1969

I was walking over to the post library with Vino Vinny, who wasn't going there, but to the bowling alley which was next door. We were talking. *I* was talking, trying to convince Vinny that he ought to get down and kiss the ass of whatever politician had managed to keep him so bored. He was shaking his head, saying he would just love to get in a little action somewhere, what, after all, was the point of learning how to use an M-16 if you never got a chance to fire at somebody who's firing at you?

Fujiyama was just barely visible in the distance, through the pollution, and I stopped, aching at the way the sun glinted off its snowcrest, trying to figure out some way to work its serenity into a *koan* that would explain it all to Vinny. Couldn't come up with nothing, though, so I just said, "Vinny, you may not know it, but we're living in a soldier's paradise—must be twenty, thirty million soldiers in the world, and we're all getting paid, and we're all getting fed, and ain't none of us had to go shoot each other since VJ Day. God only knows how much longer it's gonna last—somebody's gonna do something stupid one of these days and make you wish your guts out that you were still bored as you are now—but in the meantime we're fat rats and you better believe it."

He wouldn't, though. Dumb ass.

So I twisted away.

•

Excitement sends my tail switching after nonexistent timeflies. I *must* be close to my destination—in the logic of this place, like radiates from like—alternate times branch from decision points—a world without present war has to be near a world without any war.

I backtrack the line, inching down that parapet with my tongue hanging out from exertion. All my claws are dug in; twenty parallel worlds reverberate through my head. None of them is my goal. The wind resists fiercely, whipping my neck with my tail. I persevere . . .

. . . and find, at the bottom, a tangle of threads, all heading in the same general direction, all except one that leaps away from the others as though fearful of infection, that arrows straight up the hill to . . .

. . . the ledge of the other slopescat.

Damn.

I have to follow it, because when I penetrate its origin I hear (through someone else's ears, for then I am not yet, though that doesn't stop me from entering because I can literally force my way into worlds without me by sensing and seizing a similar personality), I hear:

February 2, 1936

"You're shitting me."

"Uh-uh, Sarge, God's honest truth."

"He sent the entire German Army back home?"

"Cross my heart and hope to die."

"What in hell for?"

"Th' radio said something about his

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not wanting to carry on the policies of his precered—his prededess—that Hitler guy."

"Well God damn."

Twisted out *quick*.

Damn sure I'll follow this line . . . and I do, even though the slopescat above me has risen to all fours and fluffed his tail. I creep up the hill, belly fur brushing the dust smooth, checking every decision point, merging into myself as a kid and hearing through his ears, seeing through his eyes, growing ever more excited as radios and newspapers and gradually TVs all tell of peace. Mothball ceremonies. Demob reviews. Bankruptcies in the munitions trade.

There are brushfire wars, though, and we still have a small standing army of forty thousand men, and as could be expected I'm in it. No Yucca Flats in this world because there was no Hiroshima, no Nagasaki . . . more decision points: here, my God, I'm a private after seven years! First time for everything I guess . . . the Army's smaller, its weapons cruder—'68 and I'm carrying an M-1?

Uh-oh. A spur leaps away from the main line—listen in ("Who's going to verify treaty adherence?"), like what I hear . . . but the spur runs directly between the front paws of the other cat, who is hissing, spitting, daring me to trespass.

All right. I will.

His claws rake my cheek as I scramble onto his ledge; half-blinded, I wince, snarl, leap—the battle is a confusion of tawny fur, dust and fluff flying, sharp teeth snapping, blood spattering—the confusion is so great I bite myself more than once, but I'm sure he does the same—he shrieks with pain and rage; he is determined to kill me, to breakfast on my remains—but I will not be denied. He blocks my path to utopia and must either leave or die. I slide out of his grip, land on all fours, bare my fangs, feint—tired, he's taken in—and I'm on him. My teeth meet through the back of his neck. His spinal cord parts. He falls limp, and dead.

I am exhausted. I wish to lie in the stillness and regain my strength, recover from my wounds. Lowering my head into his blood-smeared gut I nudge him over the edge of the ledge and watch his loose-limbed form tumble down onto the rocks below. Now that it's too late, I think I recognize him.

Before I sleep, I wonder if decomposition occurs in tweentimes.

And when I wake I scrape away the dust to look for my thin red line. I can't find it. There's a silver one, which signifies a world in which I have died, or have yet to be born, so I backtrack it to where it runs away from the red.

Ah. Obviously my death at that point helped create a new world. I tap the red and listen in:

December 6, 1979

"Don't feel bad, Sarge—you did the best you could."

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"One step quicker, Vinny, that's all I needed."

"Huh! And you'd be dead 'stead of him, right?"

"Yeah, but—"

"But what? Hell, every dude in this man's Army woulda hated you—if he'd been elected, he'da disbanded the Armed Forces just like he promised—sure, the other countries claim they done the same, but what if they haven't? Then were'd we be, huh?"

I twisted.

But I know where "we" would be—down the silver line into utopia. A world without war. A world that doesn't need me.

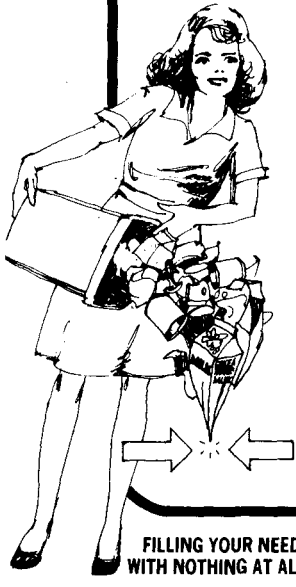
I look at the thread in the clay. Though I don't exist there, I can force my way in . . . if I want to. If I have the courage.

Because what if—in a world without war—I'm a contaminant? I am, after all, the perfect soldier, the perfect noncom . . .

As I settle down on the ledge to think, as I recall how many Yucca Flats there must have been, I realize that utopia *does* need me. Here, in tweentimes. As a quarantine station.

Because in the distance I see a shaggy tail flick, and I wonder what—or who—it could be.

There is no sky. Just me, myself, and the dead I. ■



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(It has been a standing policy in Analog to devote our pages to the best science fiction stories and science fact articles that we can publish. This has meant that we could not publish nonfiction pieces *about* science fiction itself: the ideas, the writers, the artists, the techniques of this growing, turbulent, many-faceted field. But since you, the readers, have asked for articles about the "state of the art" of science fiction, we now inaugurate a new feature—which will appear in this magazine from time to time. If you enjoy it, please let us know. If you feel that you would rather have this space used to publish science fiction tales, *be sure* to let us know!—The Editor)

A decade or so ago, when schools and universities discovered science fiction and began to offer courses in it, there was a parallel development that few fans and readers of science fiction will be familiar with. The teachers and professors who taught those courses began to write papers on the history and literature of science fiction, and those papers were published in journals that fans and readers are unlikely to encounter.

I first dealt with the subject in 1973 in a Nebula Awards Banquet speech, later published,[1] in which I spoofed this fledgling scholarship—to the considerable outrage of many members of the academic community. The outrage was misplaced. High standards of scholarship should not take decades to develop in a new field; they already exist and need only to be applied. I answered protests with a simple question: what is wrong with insisting on *good* scholarship? The purpose of this article is to give fans and readers a sampling of what passes for science fiction scholarship in academic publications.

But first, a cautionary preface: This writer does not pretend to have read extensively in these publications. He has not deemed it necessary to do so. Far too much of the material is boring, or trivial, or irrelevant. A few pages here and there, an occasional article, sometimes even a paragraph suffices. Here is Biggle's Inverse Law: A science fiction *magazine* can be judged fairly by the *best* items it contains. The editor publishes as much of what is, in his opinion, the best he can find. He then fills up an issue with the best of what's available, and if this sometimes isn't good, he has a deadline and no choice. A science fiction *journal*—a magazine of scholarly articles about science fiction—can be judged fairly by the *worst* items it contains. Such publications rely on subscribers only, and the subscription list largely consists of academics, libraries of academic institutions, and members of academic organizations. The publications frequently are subsidized at least in part. Their editors have no stringent deadlines, no worries about getting the April issue on the newsstands early in March so the dealers won't toss it on the back issue pile. Further, they publish only three or four times a year, sometimes less frequently, and if an

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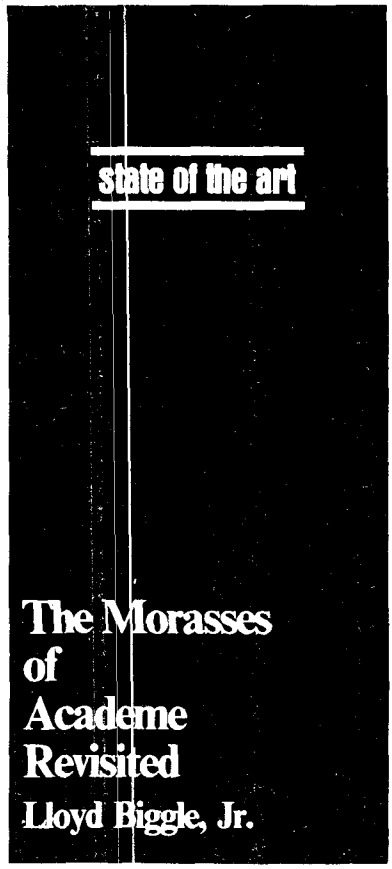

issue is three months late few subscribers will notice. They have been known to skip an issue, enlarge the next one, and call it two issues.

Therefore the editor of a scholarly journal has ample time to require that an article be brought up to his standards, if he has standards. If you find an article bristling with bad scholarship, it's a safe bet that the editor didn't know it and doesn't know what good scholarship is. Many years ago a professor of mine gave me this rule of thumb method for quickly judging a scholarly publication. I wouldn't claim infallibility for it, but I have never found an instance where it has failed me: Simply open the publication to an article in an area where you are most expert. If that one is badly done, the publication is at best grossly uneven and at worst bad throughout. Avoid it.

The following is an analysis of articles taken at random from two allegedly scholarly publications: The *Journal of Popular Culture*, which offered a special science fiction section (labeled, "In Depth Science Fiction: Studies and Evaluations") in its spring, 1972 issue;[2] and the publication unfortunately considered the elite of science fiction's scholarly journals, *Science Fiction Studies*. I chose the *Journal of Popular Culture* item by letting the magazine fall open at an article and starting to read.

A detailed consideration of the errors this article contains would require a novella-length dissertation, so I am limiting my discussion to a part of one paragraph. Consider this encapsuled history of science fiction.

"Modern" science fiction began ca. 1939-40 when John W. Campbell took over the editorship of *Astounding*, one of the many pulps that proliferated until the World War II paper shortage killed them off. Campbell stressed the need for accurate science in science fiction, asked for structured plotting instead of action oriented melodrama, and in general demanded that science fiction authors be relentless in their questionings of "what if?" and to care about the consequences of

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their questions. Since Campbell paid more than any other editor, writers listened and obeyed, and such giants of modern science fiction as Isaac Asimov, Arthur C. Clarke, L. Sprague de Camp, Robert Heinlein, Theodore Sturgeon, and A.E. van Vogt came from his tutelage.[3]

COMMENT: Discovering precisely when John Campbell "took over the editorship of *Astounding*" is not a scholarly task comparable to the decipherment of Creto-Mycenean Linear B. There's nothing wrong with a scholar writing "ca" (meaning *circa*, or "about") when the only date or dates known are approximate, as they frequently are in remote periods of history. To write *circa* when the date can be had merely by taking the trouble to look it up surely is the epitome of scholarly sloth. This particular nonscholar would have found the exact date that Campbell took over the editorship of *Astounding* if he had bothered to read his own bibliography (I took the trouble to check). Not only does he use *circa* with a two-year spread to indicate an easily verified date, but he still misses it by two years.

The news that *Astounding* was one of the pulps killed off during World War II will certainly astound all science fiction readers and especially the many collectors who think they own complete sets from the magazine's founding through its change of name to Analog in 1960.

Precisely what was John Campbell's role in the development of modern science fiction? Did he really "stress the need for accurate science?" This appraisal comes from Robert Heinlein:

"So he did, compared with Weisinger and Palmer. But JWC wasn't much of a scientist. He was lost outside of physics and chemistry . . . and even there a lot of what he 'knew' just wasn't true . . . I was repeatedly surprised at his inability in, or unfamiliarity with, fields of mathematics that I assumed that any physicist would know as well as he knew Euclidean geometry. Worse yet, he was unaware of his own ignorance. However, he did try—and that was more than Palmer or Weisinger could manage."[4]

The implication, however, is that Campbell was the *first* to stress the need for accurate science. Clifton Amsbury, one of the earliest of science fiction's active fans, remembers it differently. ". . . the demand for accuracy in alleged science fiction was begun in 1926. Gernsback had seldom run a science fiction story of doubtful accuracy in the *Electrical Experimenter* (later called *Science and Invention*) and had often run 'implication' stories. In *Amazing Stories* there was another factor: the writing-readers. There was a very active letter column. And when a story had an obvious flaw, Gernsback not only heard about it, he printed the letters. Sometimes we even accused him of letting some flaws through to stimulate comment."[5]

Did Campbell ask for structured plotting? Robert Heinlein says, "I feel

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sure that, if someone had said to him, 'Incitement, complication, crisis, catastrophe, dénouement,' he would have looked puzzled. JWC was a natural storyteller—and he did not work that way, to my certain knowledge. 'Structured plot' is not a phrase he would use—he would have said: 'A hell of a good yarn,'—or, 'It's a good yarn but you haven't finished it.' "

Did Campbell demand that science fiction authors be relentless in their questionings of "what if," etc.? Robert Heinlein considers that phrasing meaningless, and he offers his own appraisal of Campbell the editor: "Campbell tended to publish stories based on some new or assumed development in science or technology. He required an author to be both thorough and logical in pursuing the consequences of such a development and to express those consequences in terms of their effects on the characters in the story. This more nearly follows the method of H.G. Wells than it does that of Jules Verne."

Did Campbell pay more than any other editor? We are still dealing with recent historical fact, not with the decipherment of Creto-Mycenean Linear B, and recent historical facts are available for the asking. I asked; the author of that article didn't.

Condé Nast, the present owner of *Astounding* (now Analog) doesn't have the records readily available, but there are numerous authors around who sold stories during that period. Isaac Asimov and Ed Hamilton both remembered that *Astounding* and other magazines paid the same rates.

Robert Heinlein says, "*Amazing, Thrilling Wonder,* and *Astounding* all paid a basic 1¢/word in 1939-42, the so-called 'Golden Era.' There were also always some fringe magazines around that paid less, on which one dumped dogs under a pen name—and kept quiet about it. But 1¢/word was standard with the Big Three. I know, both from JWC and from 'Doc' Smith, that the immensely popular 'Galactic Patrol' and 'Grey Lensman' were sold to *Astounding* for a flat 1¢/word.

"Any of the Big Three would reluctantly pay slightly more than 1¢/word for an item an editor really wanted. But this was done on the Q.T., with the writer enjoined to keep his mouth shut. JWC eventually made public a bonus based on the reader-response 'Analytical Laboratory'—a bonus paid perhaps three or four months after the sale. This never affected me because, by the time he started it, I had already twisted his arm for 1½¢/word, very privately. . . . The notion that *Astounding* paid better and thereby got the best writers is a pipe dream by somebody who wasn't there. *I was.*"

Lester del Rey—genuine science fiction scholars should bless him, but I doubt that there are enough of them to beat a path to his door—has kept his own records going back into the thirties. He kindly consulted them for me, and here is his report. "In 1938, John was paying a straight 1¢/word—as was *Weird Tales*, I might add—though they paid on publication, while

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John paid very promptly on acceptance. This went on until early in 1939, when John wrote to me to say that he could now pay a ¼¢ bonus to his regular writers for stories he particularly liked. (February or March of 1939). The 1¢ base with possible bonus went on without change through 1943. Then in 1944 John was allowed to up his rates to 1½¢/word—still with that possible ¼¢ bonus to be added. This rate stayed for quite a few years. My first awareness of a higher rate of 2¢ came in 1949, though this may have dated from 1948. Then, of course, came *Galaxy*, and the rates went up again.

"During that time, other magazines were paying as high or higher rates. I don't have any good record of this. But the *Thrilling* group never paid less than 1¢ a word. And Ray Palmer at *Amazing* could go over 1¢ whenever he wanted to, apparently. Again, I know only by hearsay, but Bob Williams in 1942 was drawing at least 1½¢ a word, and often more.

"So Campbell tended to be no more than equal to most others and often behind in rate increases. In fact, I got the impression that the only way he could raise his rates ever was to prove to Street and Smith that someone was paying more than he was."[6]

Obviously I have not exhausted this subject. A competent scholar could make an interesting and perhaps fascinating article on "The Economics of Science Fiction Writing, 1926-1976." But it would have to be done *now*, while people with personal knowledge of the subject and their records are still available, and that would require work and genuine research. I have supplied this much detail for two reasons.

First, I wanted to demonstrate what could be accomplished if these alleged scholars would stop reprinting each other's distortions and inaccuracies and do some work; and second, I wanted to demonstrate how carelessness and laziness result in a slovenly distortion of history. John Campbell accomplished what he did, and attracted those writers he developed—and he sometimes made them rewrite and rewrite and work much harder than did other editors (one veteran writer told me he stopped submitting to Campbell because John wanted all that extra work on a story that could be sold elsewhere as it was, for the same money)—while paying the same or lower rates than other magazines. That surely is a tribute to John Campbell, the editor, and to casually state the falsehood that he attracted writers because he paid more than other editors constitutes an insult to his achievements.

Finally, anyone with an inkling of knowledge of the history of science fiction (and surely we are not being unreasonable in demanding that a scholar in this field possess an inkling) will be brought to a dead stop by the presence of Arthur C. Clarke among the writers who "came from John Campbell's tutelage." This chased me to the several collections of Clarke's stories that I own, and then to the

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science fiction indexes, all of which confirmed my impression that Clarke sold very few stories to John Campbell. Did Campbell influence Clarke? There's a simple way to find out such things—so simple, in fact, that it rarely seems to occur to science fiction scholars. I wrote to Clarke and asked him. Here is his reply.

"With regard to JWC's influence on me, *none* of the stories I sold to him were influenced by him in any way. I wrote them and sent them off (with no particular market in my mind), and my agent duly placed them with *Astounding*.

"Campbell *did* send a fairly long letter of suggestions when he rejected the first draft of 'Against the Fall of Night'. I then rewrote it, probably incorporating some of his ideas, though I can't remember. Anyway, he rejected it again so it appeared in *Startling*.

"Campbell the writer certainly had a great influence on me—particularly with his stories, 'Night' and 'Twilight.'

"Incidently, I should have the correspondence somewhere stacked away in an attic in London, so doubtless one day it will be made available to a breathless world."[7]

Considering the current level of science fiction scholarship, that attic is another place unlikely to have a path beaten to.

So much for this fraction of a paragraph. Surely this is nonscholarship, and a college undergraduate who perpetrated such silly errors should be flunked. And yet—that article reached print under the aegis of a guest editor who had the temerity to call himself a science fiction specialist when his knowledge of science fiction was so dim that he didn't recognize howlers such as those; and the article is enshrined in a supposedly scholarly reference source in school and college libraries across the country. Anyone versed in science fiction is unlikely to be misled by it, but—and this is the sinister aspect of science fiction nonscholarship in a general publication—it is much more likely to be consulted by readers who have little familiarity with science fiction. To them, this nonsense will be history.

Science-Fiction Studies was founded in 1973, and one of the items in its prospectus promised to "bring the critical apparatus of modern scholarship fully to bear" on science fiction. It is time to evaluate the implications of this.

In selecting an example of the scholarship of *Science-Fiction Studies,* I made another random choice—not by opening an issue of the journal but by skimming the contents page and picking an article whose subject interested me: "The Future History of the English Language," by Walter E. Meyers.[8]

This article is an emphatic indictment of the handling of linguistic matters by science fiction authors. "The first observation we might make is that science-fiction is a window, not into the future, but into the present: in

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its stories we can find what the science-fiction writer knows about language in general and historical linguistics in particular. Sadly . . . that knowledge is seldom more than that of the man-in-the-street. . . . Science-fiction writers show us what the man-in-the-street knows about linguistic change, and it's a paltry amount indeed."[9]

A consideration of some items of that indictment and the evidence presented will show us how effectively modern scholarship is fully applied to science fiction in this publication.

1) Meyers deplores science fiction authors' attitude toward linguistic change. From his examples:

EXAMPLE A. A 1934 story by Murray Leinster, "Sideways in Time," in which a mathematics professor leads a group of his students into a universe where the Roman Empire never fell. The Romans have discovered the New World and settled it; otherwise, they have not changed much. The travelers hear a villa owner speaking "a curiously corrupt Latin." It is this description of the results of natural linguistic change as corruptness or degeneration that offends Meyers. Hence his assertion that science fiction writers know no more about linguistic change than the man in the street.

COMMENT: Alas, what this really illustrates is that linguists may have no more knowledge about literature than the man in the street. *It is not the author of the story who hears that "curiously corrupt Latin."* It is the mathematics professor and his students, and there is no evidence that they have any knowledge whatsoever about the natural development of languages. If one of them had, the author would have had to establish carefully where he got it. The professor is an expert in mathematical physics, which is quite enough for him to be expert in.

This level of scholarship can be compared to the asinine criticism that assails the author's grammar because the village idiot in his story does not speak polished English. When the characters of a story are laymen, their knowledge of linguistics *should* be that of laymen. In fact, it *must*. The layman with a vague knowledge of classical Latin would reasonably consider the Latin that has undergone all those centuries of natural linguistic change as frightfully corrupt.

This failure to recognize that the language, the beliefs, the actions of characters in fiction are their own and not the author's is the hallmark of critical and scholarly ineptitude; and the author who made all the characters in his stories linguists to please critics as careless about literary values as this one would write very peculiar fiction indeed.

EXAMPLE B. In Philip José Farmer's novel, *Flesh*, an anthropologist refers to the English of the future as ". . . farther from our brand than ours was from Anglo-Saxon. . . . It's degenerated, in the linguistic sense, far faster than was predicted."

COMMENT: Once again we have a layman (in linguistics) as a character.

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These two examples give us an illuminative glimpse of the scholarship standards of *Science-Fiction Studies*: In each of them the author has shown an excellent awareness of linguistic change; yet because the laymen characters who comment on it do not do so in terminology pleasing to Meyers, he has the temerity to conclude that the authors know no more about it than the man in the street. The man in the street could not possibly have presented either of those concepts.

2) Meyers states that while the knowledge of linguistics demonstrated by science fiction authors is low in general, it is abysmally low when it comes to historical linguistics. A comment about the history of English, in particular, is most certain to be ludicrously wrong. Among those ludicrous errors:

EXAMPLE A. A story states that speakers of the Northumbrian and Sussex dialects of Old English—about the year 1100—couldn't understand each other.

COMMENT: If Meyers considers himself an expert in the Northumbrian dialect for the period ca 1100, he is considerably braver than any linguist I talked with. No documentary evidence survives from the north of England for that period. The Northumbrian dialect ca 1100 has to be deduced from earlier and later evidence, and the wise scholar making such a deduction allows a reasonable margin for error. There are shades of opinion among the linguists I consulted, but the agreement is unanimous that there would be initial difficulties in communication. There very possibly could have been substantial initial difficulties. The counties are at opposite ends of England, travel was infrequent and uncertain, and there was no BBC—which even today has not succeeded in uniting that island linguistically. This kind of nitpicking may provide a valid basis for discussion in a journal of linguistics, but any assertion on that tenuous a foundation has no place in literary criticism.

EXAMPLE B. A story labels Chaucer's "Parson's Tale" as "Old English."

COMMENT: Meyers himself admits, in a footnote, that the Oxford English Dictionary definition now would permit the application of the label "Old English" to Chaucer. If that isn't enough to make his criticism, rather than the example, ludicrous, the evidence indicates that he either misread the story or didn't read it at all. The speaker using the term "Old English" is not a person, but a kind of computer—and the computer is functioning more than a hundred years in the future. Back in the 1930s, reference works defined Old English as covering the history of the English language from 450-1066. In 1969 the American Heritage Dictionary defined Old English as "English from the beginning of the 8th century to the middle of the 12th." This is a substantial change in viewpoint for a third of a century, and the Oxford English Dictionary has advanced the terminal date to include, for popular use, all obsolete forms of

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the language. This—although Meyers does not recognize it—is natural linguistic change, which of course concerns the evolution of word meanings as well as that of grammar, diction, spelling, and pronunciation. His position is that a definition already obsolete in popular speech will be frozen in our language and in linguistics for more than a century. Put another way, in his comments noted above, Meyers is severely criticizing science fiction authors when their stories covering a period of time do not reflect his own concept of linguistic change; but he is here maintaining that the technical terminology of his own profession will undergo no change whatsoever, and that a science fiction writer using a linguistic term in a story set at the end of the twenty-first century must assign to it a meaning that already is outdated in popular speech. Come, Linguist Meyers! This demonstrates an ignorance of linguistic change somewhat below that of the man in the street.

Unlike Meyers's nitpicking, this is a genuine linguistic horror. In the far future, "Old English" could refer to anything from Beowolf to the twenty-fourth century. The year after tomorrow, linguists could decide to redefine their historical terminology—which needs it—and assign a new term to the Anglo-Saxon-Danish language that presently is called "Old English" by them. In an unexpected outburst of logic they might even decide to call it Anglo-Saxon and move the term "Old English" forward to cover the twelfth to the fifteenth centuries, the period they now call "Middle English." And for Meyers, I offer this first rule for scholars of literature: Read *all* of the story.

EXAMPLE C: A story in which a character says, "Have no fear," striking the final vowels of the words with a grunting emphasis in the curious brogue of Middle English.

COMMENT: What this demonstrates is precisely the opposite of what Meyers is trying to prove—namely, that science fiction writers display a considerable knowledge of linguistics and natural linguistic change. Those interested in the manner in which an alleged scholar will seize on one minor point in a long story in an attempt to support a fraudulent premise are referred to the story.[10]

The excerpt cited by Meyers is simply another instance of his confusing a character's subjective viewpoint with the author's knowledge. This character is unique—he has lived since the age of dinosaurs, and in that long time span he has known many peoples and their languages. He is looking at Middle English, not with the perspective of the twentieth century linguist (which Meyers thinks all characters in fiction should be) but as one viewing that language from the other side of time. The term "curious brogue" means nothing more than that the dialect sounded strange to him, and Meyers is in no position to say that it wouldn't. Concerning the grunting emphasis on final vowels, this again is the character's subjective

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viewpoint; but I refer Meyers to the problem of final *e*'s in Chaucer and others of that period. There are unresolved questions as to whether they were scribal and dropped in speech, or spoken, and if spoken how they were pronounced. The author of a story cannot say, " 'Have no fear,' he said, speaking this way according to one school of linguists and that way according to another." It's a rather silly point to raise in a literary journal, and if that's the only item to criticize that Meyers could find in a thirty page story replete with linguistic problems—when he obviously was scraping for things to criticize—the author can feel complimented, and Meyers should be ashamed of himself. A single nit that in no way affects the quality of a story should be dealt with in a private letter to the author.

EXAMPLE D. A character in a story—who is a professor of the history of English and by implication a linguist—states that the Great Vowel Shift was caused by the Norman Conquest.

COMMENT: This is the prize example, absolutely. Here Meyers would seem to be justified in demanding that his character have the knowledge of a linguist and use a linguist's terminology accurately. Alas, the fictional professor is both a crackpot and a wag. In the story it is transparently obvious that he is pulling the narrator's leg, and in the process he has most delightfully pulled that of linguist Meyers. He does indeed say that; he obviously believes nothing of the sort. Several pages later we find what Meyers should have pounced upon as an even more ludicrous error. "Kikhoff once said he thought maybe the vowels stayed there and we shifted." Is it possible for any intelligent person to read these statements without recognizing them for the gags that they are—especially in a humorous story? Meyers managed it, or perhaps he didn't read as far as the second example. For him I offer this second rule for scholars of literature: read *all* of a story—*carefully*.

3) Meyers feels that the tendency of science fiction writers to indicate the universal spread of the English language in the future is sheer chauvinism. Since he has stressed this in a particularly nasty fashion, it is apt for us to consider whether his treatment of contemporary linguistics in science fiction is any more astute than his treatment of historical linguistics.

In a book of some dozen years ago, *The Treasure of Our Tongue*, by Lincoln Barnett, the first chapter is entitled, "The Linguistic Wonder of the Modern World." To quote from this chapter, "English has become the most widely spoken language on earth. Today 300 million people—nearly one in ten—employ English as their primary language, and 600 million—nearly one in four—can be reached by it in some degree."[11]

Barnett further points out that English is written, spoken, broadcast, and understood on every continent, that it claims a wider geographic range than any other tongue, that it is spoken by

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members of every race and every major religious faith, and that it is spreading around the planet at a constantly accelerating tempo. Virtually every capital city in Asia and Africa (save for former French colonies) has an English language daily paper. More than 70% of the world's mail is written and addressed in English. More than 60% of the world's radio programs are in English. (Russia and China use English for their propaganda broadcasts around the world.) English is the language of international- aviation, spoken by pilots and airport operators on all the airways of the world. It has become the language of diplomacy to an extent never achieved by Latin in the ancient world or, more recently, by French. When representatives from twenty-nine African and Asian nations met at Bandung in 1955, the proceedings were conducted entirely in English—that language being the only common denominator among the multilingual delegates. English classes are in demand around the world, assisted by U.S. TV and radio programs. West German schools require six to nine years of English. Menus in the Caribbean area are printed in both English and Spanish. English is compulsory at all levels at El Axhar University in Cairo. And so it goes—Latin America, India, the Middle East, Africa, Europe, the spread of English is a flood. Linguist Meyers apparently has not noticed this or considered its implications.

Meyers's statement demonstrates not only a blindness to linguistic facts, but a total ignorance of the techniques of science fiction. Science fiction authors frequently take a trend and ask themselves, "What might happen if this continues?" (They sometimes deliberately contradict a trend, for good reason; but this aspect of science fiction technique would seem to be beyond the grasp of Meyers and *Science-Fiction Studies*.)

Meyers remarks, in commenting on Arthur C. Clarke's *Childhood's End*, "Although Clarke is an Englishman, he seems to dread that task which the average American fears more than any other: that he will have to learn a foreign language. A separate article could be written dealing solely with the shifts and subtleties science-fiction writers devise to spare their characters that job. And naturally the easiest solution is to have everybody else learn English."[12]

But everyone else *is* learning English! I asked Clarke if, twenty-five years after the fact, he saw any reason to revise his concept of a universal use of English in the future. He replied, "Since I wrote *Childhood's End*, of course, events have made that prediction still more inevitable (e.g. the compulsory use of English by all international airlines). The direct broadcast satellites will accelerate the process, as I have often pointed out."[13]

I have failed to find a linguist who does not believe that English already is a world language or is on its way to becoming one. Meyers should be congratulating science fiction authors on their prescience in this area.

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4) Meyers is equally obtuse in his criticism of those stories that suggest a future population that verges on illiteracy. He ignores completely another obvious trend, dismissing the concern of science fiction writers about education and the increasing inability of our population to read and write as reflecting a "media-approved attitude of the larger society." Obviously he has few contacts with school teachers below the college level—or even with college teachers trying to teach English 1 to virtually illiterate freshmen. The alarm is a general one; the evidence of decline is overwhelming. (I suppose Meyers also considers U.S. Office of Education statistics that 20% of adult Americans now are unable to cope with routine activities such as shopping or getting a driver's license, and another 34% barely gets by as a "media-approved attitude." That totals out at 54%, and a more recent survey by the Bureau of Census has raised this figure to 60%.) Instances in which information that once had to be acquired by reading now is available through listening or looking at pictures—from television newscasts to highway signs—are constantly increasing. For a linguist, Meyers has a most peculiar unawareness of linguistic trends, and his incomprehension of science fiction is further evident in that he views these stories as predictions. They are explorations of a "what if" future, and as often as not they are intended as alarm bells, to call attention to the dangerous implications of the trend.

Precisely how important are the peripheral nits that a specialist can pick in a science fiction story? Meyers has used snippets from here and there to prove their authors' ignorance of linguistics. To demonstrate the absurdities that can result from this technique, I cite a story by James Blish in which there is a sneering remark about the playing of orchestral music on the piano. The orchestral music in question is one of Dvořák's *Slavonic Dances*—which Dvořák originally wrote as a piano composition and later orchestrated. If I had been reviewing the story, I wouldn't have mentioned this (though I might have sent the author a tongue-in-cheek note about it). It in no way affected the quality of the story or my enjoyment of it. The Meyers technique would have been to pounce upon this and display it as evidence of the author's ignorance of music—but James Blish had a profound knowledge of music. He just happened to be unaware of an obscure fact likely to be known only to musicologists. Such errors are found in all of literature, including the best—Shakespeare's stature is in no way affected by his geographic absurdities such as the one that shipwrecked a character in Bohemia. As I'll demonstrate later, authors work at being as meticulous as possible; but they are not immune to error, and science fiction authors face an unusual hazard because they must plumb all of human knowledge for their subject matter, frequently on a highly technical level. The genuine errors Meyers cites are

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far more excusable than the ones that he makes.

But Meyers does not view all of science fiction with disapproval. If we consider the stories and novels he mentions favorably and add those he has failed to read, or misread, or distorted, we find that he has disproved his premise.

I regard this article as particularly unfortunate. It is not a "science fiction study." It is a virulently anti-science fiction study, with the evidence arranged accordingly, and as such it is far worse than bad scholarship or nonscholarship. And yet—it concerns an area of science fiction that undoubtedly has been neglected, that has produced its linguistic horrors, that probably few writers have sufficient background in, and I feel that a competent linguist could teach us much. I selected this article in the hope of learning something useful. It is unfortunate that Meyers couldn't take the time to grasp a fundamental problem in science fiction technique, and that he has had so little contact with writers that he has no conception of their problems and how they work.

I said "science-fiction technique," but the problem is fundamental to all literature. It is merely more conspicuous in science fiction, and it concerns the treatment of every field of knowledge, not just linguistics. The problem is to present enough that is logically new or different, so as to create the verisimilitude of a distant place in time or space or whatever illusion of strangeness the setting requires; and at the same time to preserve enough that is familiar, so that the reader can understand what is going on. Meyers says, ". . . if there is little change in the language the characters are using, the reader has no trouble understanding it; if there is a great difference in the language, then the writer simply states that his characters are speaking in Old High Martian or the thirty-fifth-century development of a present tongue, and writes his dialogue in the English we know. But midway between these two extremes lies difficult ground."[14]

It is all difficult ground, and although Meyers states the problem, he obviously does not comprehend it, nor does he seem aware that he is dealing with a literary commonplace that has been solved, in one way or another, for a long, long time; because any novel written in English with a setting in a foreign country must cope with the same problem. One solution, for example—if the setting is France—is to write English and toss in an occasional word or expression in French, hopefully in situations where the reader who doesn't know French can still grasp the meaning, and thus maintain that essential illusion that the characters are speaking French. The same solution can be used with Old High Martian. Unfortunately, as may be seen from Meyers's remarks about *Childhood's End* quoted above and from other discussions in the article, if a story is set in France, Meyers expects it to be written in French. And if a story is set in the future, Meyers

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wants dialogue in a bona fide future language, whether the reader can comprehend it or not.

As a matter of practical necessity, the things in science fiction or any fiction that receive the most emphasis are those most vital to the story. If an entire story takes place on one planet, there may be little or nothing in it about space travel. If linguistic matters are of central importance, you are likely to find them worked out carefully. With peripheral material, the author is constrained by the amount of space available to limit himself to a touch here and there to achieve the verisimilitude I mentioned. Meyers, with all of a specialist's vanity, wants a complete language worked out and used in every story—and the reader be damned.

It should be acknowledged that Meyers expresses sympathy several times for the science fiction writer who must attempt to predict the future development of language: ". . . only one job requires its practitioners to put down on paper their estimates of the language of the next decade, the next century, or the next millennium—the job of writing science fiction."[15] He then ranges through science fiction criticizing widely the efforts that are made. Conspicuously absent is any suggestion of his own as to what our future language may be like. This is the one indubitable display of wisdom in the article.

A linguist could only predict the future of a language by extending the principles of language development he has learned in studying the past; but no one knows what new technological or sociological or cultural development, unknown to the past, may have an impact on the future, or to what extent it may modify linguistic change. The science fiction writer is entitled to ask "what if" and explore the results.

And then there is the problem of language among utterly alien creatures, from other worlds, and Meyers has no more right to attempt to apply human linguistics to their forms of communication than other specialists would have to inflict human anatomy or physiology on them.

Concerning the manner in which writers work, I could cite many personal examples, but one should suffice. In my novel, *The Fury Out of Time*, part of the action takes place on an air force base. As an ex-infantryman, I naturally knew as much about the air force as the average infantryman in the street, and my manuscript was full of errors. However, before I typed a final draft, I cornered the entire Air ROTC staff of a major university and spent a morning with it. We went through every line of the air force scenes and corrected the mistakes. (The officers didn't know the answers to all of my questions, but at least they had manuals and could look them up.) If any error concerning the air force slipped through, no one bothered to bring it to my attention.

I mention this because in my queries of linguists about the material in Meyers's article, I encountered one

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who remembered being consulted by the author on the very point upon which Meyers is castigating him for his stupidity in linguistics. This author did his homework properly—to check the accuracy of a single line in his story he took the trouble to consult a specialist. Would that science fiction scholars were equally conscientious! The author was under no obligation, for that brief reference, to convoke an assembly of linguists, resolve their differences of opinion, and include in his story a tract on the result.

On all counts, with both articles, I blame the editors. Mr. Meyers is a specialist who has the grace not to call himself a science fiction specialist. He needed an editor who knew the field well enough to refer him to important stories he overlooked—Beerbohm's "Enoch Soames," for example, a possible if not probable inspiration for a much later story he describes at length and with enthusiasm; who could ask him to think again about the problem of story-language and character-language and reader-language; who had sufficient comprehension of science fiction to understand its techniques and enough knowledge of authors to know how they work; who could convince him to concentrate on stories where linguistics plays a prominent enough role so that analysis and constructive speculation could make a positive contribution. Science fiction scholarship needs a John W. Campbell of scholarly editing, who can supply an avalanche of ideas, winnow out the gaffes, and insist that scholarly standards be met. Obviously *Science-Fiction Studies* does not have such an editor.

By Biggle's Inverse Law, this article tells us as much as we need to know about standards of scholarship in *Science-Fiction Studies*. It does not imply that there will be no excellent articles in this journal. There may be many of them, but when they appear it will not be because of editorial standards and guidance.

The March 1976 issue has an oddly revealing item. The previous issue had been devoted to the works of Ursula K. Le Guin. This issue contains her reply. She writes, "It seems a curious fact that among the academically oriented critics of Le Guin's work, no one has turned for elucidation of the later fictions to the early works of scholarship." She refers to her honors thesis at Radcliffe College and her master's thesis at Columbia University. After discussing relationships between those early scholarly works and her later fiction, she concludes, "Incredible that the professional critics have ignored this rich field of inquiry, the Le Guin Theses!"[16]

It is not merely incredible; it is preposterous. Here we have so-called scholars ruminating at length about the sources of ideas and style of a living author without bothering to consult her or scratch more deeply than their own vest pockets. I call them Vest Pocket Scholars—the boundaries of their research are restricted to what is easily within reach, and vest pockets rarely extend as far as

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theses at Radcliffe or Columbia. Even discovering their existence would have been work, although it would have required only a letter to the author. If there were no affinity at all between the theses and the later fiction, the genuine scholar nevertheless would have wanted to establish that fact and ponder it.

(I recall making a special 250 mile trip to Chicago to consult three or four books not available locally. None of them contributed a thing to my research project, but if I had not carefully verified that fact myself, my faculty committee would have raised hell. I also recall the professor who thundered at me, "You aren't a scholar until you're willing to spend an entire summer on a research project that will at most give you material for one footnote!" Science fiction scholarship is a relatively new field, but this does not totally excuse it from standards of scholarship developed over many years in older disciplines. It is time indeed that someone started applying them.)

So much for *Science-Fiction Studies*—a journal of Vest Pocket Scholarship.

Science fiction authors probably are unique in the entire history of literature in their availability. Almost every week, somewhere in the U.S. and frequently in foreign countries, there is a science fiction convention with professional writers in attendance. This is the place where the conscientious scholar could strike gold—delve into historical recollections, find out about the existence of records so as to avoid such stupidities as I have pointed out, obtain personal information about authors, receive valuable guides and suggestions for research projects.

In my Nebula Awards Speech I mentioned the dangers inherent in the scholarly consideration of a contemporary art. It must be done entirely without historical perspective. In compensation, there is the tremendous advantage of studying an art where the testimony of the artist is readily available.

Too many scholars are struggling with the disadvantage while ignoring the advantage. *The information is accessible; all they have to do is ask.* They can attend conventions as fans do, meet the writers, and tap this wealth of material. Part of that wealth consists of the science fiction fans. There still are fans around who have been reading science fiction since the 1920s. Some have encyclopedic memories that I find awesome, and they knew the early writers personally. Anthologists discovered their value long ago, and they could be equally valuable to scholars. Alas, with some highly conspicuous exceptions, one rarely meets scholars at conventions.

As a result, matters critically important to the history of science fiction are not being investigated. What did the "tutelage of John W. Campbell" imply? Probably every writer Campbell worked with has his own interpretation of that, and the summation would make a fascinating study. Such a study would require traveling

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about and talking with or writing to all of those authors; the Vest Pocket Scholar would prefer to wait until they are dead, and then such lines as "Since Campbell paid more than . . . stressed the . . . asked for . . . demanded . . ." can be foisted onto an unsuspecting public without contradiction. These scholars prefer to trace the effect of Marxism on the dystopian novels of the 60s (to the immense surprise of many of their authors) or Freud's impact on something or other. They are, in short, writing articles for each other while the history they should be recording slips away from them. To go out and find historical facts while they're still available is work.

But all is not lost. There are, as I said, conspicuous exceptions. Whenever I see Clifford Simak, it seems that I also see Tom Clareson following right behind him with a tape recorder. When Clareson writes about Simak, I'm confident that he won't make the stupid gaffe of overlooking a thesis, if Simak has one buried somewhere, or anything else. Joe De Bolt's face is another familiar one at conventions, and his work on John Brunner displayed extremely conscientious scholarship. And there are others. I hope there are many I haven't met simply because they attend conventions I don't go to.

But someone should have been following Ed Hamilton with a tape recorder. His career spanned all of modern science fiction, he knew all the early writers (and many of the later ones) as personal friends, and he was history personified—a storehouse of information and anecdotes. Because of the lack of stretch in vest pockets, that is now lost forever. There are other older writers and fans who could richly reward the scholar who would take the trouble to record their recollections. The newly founded Science Fiction Oral History Association will help in this area, but despite its potential importance to scholarship, the support it has received from scholars has been meager. Thus far the science fiction fans have provided most of the support—financial and otherwise.

Which brings us to a fascinating subject: the science fiction fan as a scholar. I wonder if any scholar has had the perception to make a study of fan contributions to science fiction scholarship, or how many scholars are even aware of them. I see article after article that would have been impossible to write without the Day and the MIT Indexes—with no credit given. The Tuck *Encyclopedia* is the work of a fan, and he went to the trouble to contact the writers included—from Australia, yet. Sam Moskowitz, a fan turned professional, is a much published historian and biographer. I've seen articles in fanzines, by fans with no training in scholarship, that were vastly superior to the two articles I have discussed here. It was fans who compiled the indexes and bibliographies and published interviews with authors and kept the conventions going to make that wealth of scholarly material readily available. Fans formed the

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first collections and laid the foundations for a rich period of scholarship—that unfortunately has not materialized. Some of the more competent science fiction scholars started as fans, which is in no way surprising. If I were a scholar with a research problem in science fiction, I would head for the nearest convention and start asking questions of authors and fans. The younger scholars will never catch up with them in their reading, and it's silly to be writing articles in ignorance when the information is there for the asking.

One fan told me—sadly—of a well known professor who was at work on a book and contacted him to ask if he could "borrow his collection." The fan protested that it would require a truck or trucks to move it, not to mention the work of packing. He invited the professor to visit him any time and make as much use of the collection as he wanted, and he was perfectly willing to loan selected items that would be of use to the professor. The distance was less than a hundred miles; the professor's vest pocket did not stretch that far. He wrote the chapter without consulting the material it was written about, and the chapter was riddled with errors. The fan said, ruefully, that the professor apologized to him for what he had done after the book was published. That book, unfortunately, was a success and probably is considered a standard reference among other Vest Pocket Scholars.

Vest Pocket Scholarship.

It's time for a change.

NOTES

1 *Riverside Quarterly*, Vol. 6, No. 2 (April, 1974), pp. 100-109.
2 *Journal of Popular Culture*, Vol. 5, No. 4 (Spring, 1972), pp. 839-996.
3 Robert Lee Cansler, "Stranger in a Strange Land: Science Fiction as Literature of Creative Imagination, Social Criticism, and Entertainment," *ibid.*, p. 945.
4 This and subsequent quotations from Robert A. Heinlein are taken from a letter of September 30, 1976.
5 From a letter to Pamela Sargent of June 27, 1977, of which Mr. Amsbury kindly sent me a copy.
6 Letter of September 16, 1976.
7 Letter of September 15, 1976.
8 *Science-Fiction Studies*, Vol. 3, Part 2 (July, 1976), pp. 130-142.
9 *Ibid.*, pp. 140-141.
10 Ed Jesby, "Ogre!" *The Best From Fantasy and Science Fiction*, Eighteenth Series (New York: Doubleday & Co., 1969), pp. 69-99.
11 Lincoln Barnett, *The Treasure of Our Tongue* (New York: Alfred A. Knopf, 1964), p. 3.
12 Meyers, *op. cit.*, p. 134.
13 Letter of December 10, 1976.
14 Meyers, *op. cit.*, p. 139.
15 Ibid., p. 131.
16 Ursula K. Le Guin, "A Response to the Le Guin Issue," *Science-Fiction Studies*, Vol. 3, Part 1 (March, 1976), pp. 43-44. ■

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BY SPIDER ROBINSON

the reference library

The Persistence of Vision, John Varley, Dial/James Wade, 279 pp., $9.95
Study War No More, Joe W. Haldeman, St. Martin's, 278 pp., $8.95
The Genesis Machine, James P. Hogan, Del Rey, 300 pp., $1.75
The Illustrated Roger Zelazny, Preiss & Morrow, Baronet, 60 pp., $8.95 soft/$10.95 hard
Meeting of Minds, Steve Allen, Hubris House/Crown, 181 pp., $10(!)

I've been wanting to do something nice for John Varley for over a year, now—and at last I've got my chance.

I wanted, for instance, to give Varley my vote for last year's John W. Campbell Award for Best New Writer. During one incredible six or eight month spree, Varley had just about papered science fiction with first-rate stories, one after another, that went off like firecrackers in an enclosed space. Each was so striking and original that by the time Varley's commando attack was done (or had paused), the question before Best-Of-The-Year editors was not whether to include Varley but which story to pick. It was probably the most thorough blitzkrieg since the Beatles' first U.S. tour, and a similarly pleasant one.

But a technicality intervened: somehow, although Varley had been astute enough to wait until he had a whole boxful of terrific stories and mailed 'em all off at once, he had been careless enough to have published a single story a few years earlier, which disqualified him for the Campbell Award. (This is not, emphatically not, to disparage C.J. Cherryh, who earned her award. But Varley deserved to be on the ballot.)

Then I heard that Varley was publishing his first novel. Oh boy, I thought, here's my chance—now I have a sufficient pretext to praise the man in my column. Alas, the best I could give the book was a mixed review: it was quite good for a first novel, but its flaws were crippling. By this time I was gnashing my teeth (as opposed to teething my Nash, or, autoeroticism). I wanted to sing Varley's praises, but I couldn't review magazine appearances.

But here at last is a collection of the very best of those above mentioned short stories, and now I am unchained. **The Persistence of Vision** is one of the best single-author collections ever assembled. It is so good, in fact, that Varley may, like Zelazny, Niven, Delany and many others, have painted himself into a corner: henceforth anything he publishes that is not brilliant will be condemned as mediocre by smartass reviewers like me.

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Varley's particular genius lies not so much in his pyrotechnic ability to startle (one story opens with the protagonist relaxing on a table with the top of his skull removed; another involves a . . . well, a *weather sculptress* . . . who is beginning to find being repeatedly murdered irritating), as in the fact that each startle is so logically worked out and skillfully presented that the shock of the startle is followed immediately by a feeling of, "Why, of course. Nothing startling about it." He is more than a brilliant extrapolator: he is a craftsman so skilled that his brilliant extrapolations seem only inevitable. You'd have thought of it yourself in another minute. To combine Nivenesque invention and logic with Besterian pace is no mean feat, and Varley pulls it off time and again.

If this collection has a fault, in fact, that is it: Varley pulls off the same trick again and again. This is only partly mitigated by the fact that it is a brilliant trick: after a while all the startling starts to give you a headache. But then nobody says you *have* to read the book in a single sitting.

Many critics and reviewers (myself among the latter) have complained that Varley's weak point is *emotional* logic—that his characters never quite become as real as his backgrounds—and indeed there is some evidence in *Persistence* to support this contention. "Retrograde Summer," for instance, the weakest story in the collection, is a brilliant travelogue of the planet Mercury (nobody in SF knows our own solar system as intimately as Varley), set in the context of an emotional dilemma that fails to convince even momentarily.

But taken together, the stories in this book tend to make me feel that Varley *does* create strong human characters with believable emotions—it's just that the emotions are new to me, because they're as extrapolative as the science background. If you accept a world in which sex changes are frequent, conception is voluntary but severely restricted by law, organ transplants and brain/computer interfaces are commonplace, the very concept of fatherhood has vanished, and physical death is a correctable nuisance, you have to allow for an emotional logic also so changed as to be unrecognizable. If, therefore, it occasionally fails to ring true, to a twentieth century terran primitive, well, that's science fiction, buddy. (A modern love scene, for instance, would confound a Victorian reader.) (In fact, it happens all the time.)

Perhaps the problem is that these subtleties are not best conveyed by Besterian yank-'em-along pacing. I found that forcing myself to read slower helped a lot—the more work I put into reading the stories, the more I got out of them. This was fortunate: it put me in the proper frame of mind to read the last story in the volume, the title story. One is hesitant to make flat pronouncements, of course—but this time one can't help one's self:

"The Persistence Of Vision" is the finest science fiction story written in the last couple of years. No question.

My wife Jeanne and I have read it a total of five times between us so far, each time slower than the last, and we're both still blown away. I suspect we'll have read it ten times apiece before we're done. I won't spoil it by telling you a thing about its novel and

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striking plot; I'll only say that (perhaps because for *once* Varley gives me a viewpoint character with whom I share a cultural matrix) it is emotionally devastating. As well as intellectually dazzling and rigorously worked out. It is, to my mind, what science fiction is all about, and it alone is worth the hardcover price of this book.

It is that very persistence of vision that will, I think, almost undoubtedly keep Varley transcending himself book by book. I knew he was a clever and powerful writer. Now I know he's got *soul*.

One small gripe before I go on. Varley has undertaken a future history saga, and several of the stories in this book are part of his Eight Worlds cycle. But unlike Heinlein, Niven, or any of a dozen other writers who have used the technique, Varley has *begun* his future history with some very radical base-assumptions (aliens have appeared and kicked the human race off the planet Earth, but otherwise ignored us; other aliens have inexplicably begun sending us free technological information from deep space, etc.). And unlike those gentlemen, Varley has therefore been unable to plant all the necessary background painlessly into *each* story. Each one thus reads like part two of a three part serial: questions unanswered fore and aft. (The same held true, dammit, of Varley's first novel, *Ophiuchi Hotline*, which I was hoping would explain everything.) I don't see any way around it, and hopefully some day *all* Eight Worlds stories will be assembled into one mighty volume which will tie up all the threads. But right now it's mildly irritating—and a classic example of why even a brilliant writer should avoid a future history with too many radical assumptions to pack unobtrusively into a good short story.

Notwithstanding, this collection is highly recommended, and rates a solid 95% on the Spidermeter

$$\left(\frac{\text{stories enjoyed}}{\text{total stories}} \times 100,\right.$$

with a variable Finagle Factor). *The Persistence of Vision* is a debut collection to rank with those of Heinlein, Bester, Kornbluth, and Tiptree.

I know of several anthologies of SF war stories, but somehow Joe Haldeman's **Study War No More** is the first one I've seen on *alternatives* to man's second oldest contact sport. (Yes, *second*-oldest. What did you think the first war was *about*?)

"Theme" anthologies are usually a bad idea. "SF About Time Travel" gives you six explanations of the Grandfather Paradox and so on. I actually saw a book once with over two dozen different doomsdays, and couldn't *imagine* the kind of masochist who'd read it in a sitting.

This theme, though, gives enough scope for a wondrously diverse book. The question before us is, when and how might the human race mature beyond the schoolyard fistfight? Could people and governments ever start acting marginally more intelligently than Bronx streetgang warlords? And what would happen *then*?

The cast is spectacular, including Ellison, Bova, Anderson, Harrison, Effinger, Reynolds, Knight, Nabors, Asimov, and Haldeman himself; and their performances are representative. All of the stories are good, some are

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A Calendar of Upcoming Events

log

5-8 September
COMPCON, Annual meeting of the IEEE Computer Society at Washington D.C. Theme—Computer Communications Networks. Info: Harry Hayman, Box 639, Silver Spring MD 20901.

6-8 September
OCEANS '78 (OEC, MTS) at the Sheraton Park, Washington, D.C. Info: Myra Binns, Marine Tech. Society, 1730 M Street N.W., Washington, DC 20036

22-24 September
FANTASY FAIRE VIII at the Pasadena Hilton Pasadena, Cal. Registration: $5 until 1 July, $7.50 until 1 September, $10 thereafter and at the door. Info: Fantasy Faire, 1855 W. Main, Alhambra CA 91801.

26-29 September
Environmental Aspects of Nonconventional Energy Resources (ANS) at Denver, Col. Info: R. A. Petzke, Public Service Co. of Colorado, 5900 E. 39th Avenue, Denver CO 80201.

29 September-1 October
PgHLANGE X (Pittsburgh area SF conference) at Marriott Inn, Pittsburgh, Pa. Guest of Honor—Rick Sternbach; Fan Guest of Honor—Phil Foglio. First 300 registrants receive a signed, numbered portfolio of the GoH's artwork. Registration: $7.50 until 15 September, $10 thereafter and at the door. Info: Barbara Geraud, 1202 Benedum-Trees Bldg., Pittsburgh PA 15222.

15 October
Deadline for entries in the NESFA Annual SF Short Story Contest. Write for rules BEFORE submitting entries. Info: New England Science Fiction Association, Box G, MIT Branch PO, Cambridge, MA 02139.

23-27 August 1979
SEACON 79 (37th World Science Fiction Convention) at Metropole Hotel, Brighton, U.K. American Guest of Honor—Fritz Leiber; British Guest of Honor—Brian Aldiss; Fan Guest of Honor—Harry Bell; Toastmaster—Bob Shaw. Registration $7.50 (supporting) to 31 December 1978, $15 (attending) to 31 December 1978. Info: Seacon 79, 14 Henrietta St., London WC2E 8QJ, U.K. This is the science fiction world's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition, banquet, the works. Join now and get to nominate and vote for the Hugo awards and the John W. Campbell Award for Best New Writer.

ANTHONY R. LEWIS

*Items for the Calendar should be sent to the Editorial Offices, **four months** in advance of the issue in which you want the item to appear.*

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excellent (the Ellison and the Haldeman especially) and Dr. Asimov's *F&SF* essay reprint is provocative and oddly encouraging.

But the absolute standout smash hit of the collection is Damon Knight's "Rule Golden."

I said a few pages ago that Varley's "Persistence of Vision" was the finest SF story written in the last year or two. When I finished "Rule Golden," I . . . no, strike that: when I *recovered* from finishing "Rule Golden," I was certain that Varley had been bumped to number two. Knight's story was superb in every imaginable respect, staggering, gripping, thought-provoking, spiritual, exquisitely crafted, simply *impeccable,* and, of course, unquestionably a brand new story. Then I turned to the credits page and got my mind blown *again.*

Knight first published that sumbitch in 1954, nearly a quarter of a century ago.

Damon Knight presents me with an unusually sharp antinomy (lovely word). As a reader, I keep wishing that his wife, Kate Wilhelm, would procure a .38 Special on a .44 frame, place it upside his head, and threaten to discharge its contents into his third eye if he gets up from the typewriter for longer than a bathroom call (while continuing, of course, to type her own stories with her other hand). As a writer, however, I hope that Knight takes as long as he damned well pleases to produce such perfect gems as these, or not at all, as suits him.

All I know is I'd sure like to see more novellas as good as "Rule Golden," and I'd like to see some more anthologies as solid as *Study War No More.*

I've always been surprised by how vanishingly little science fiction turns out to be fiction *about science.* (Even the Asimovs, Bovas, Nivens and Clarkes most often write fictions involving science, rather than fictions concerning science.) And of the stories that *are* about science, half of them are actually bitterly *anti*-science (virtually all "sci fi" movies, and a shocking percentage of SF books and stories) and most of the rest are as dreadfully written as the stuff Uncle Hugo used to call "scientifiction."

Why is this? When I find a novel about science, a rather breathtaking book which dares to suggest that science (coupled with conscience) might actually Save The World, why in the hell do I feel compelled to apologize for it, to assure you that the characterization isn't flat and the prose isn't awkward and the story isn't implausible?

Brad Clifford, the protagonist of James P. Hogan's **The Genesis Machine**, is a member of that rare and endangered breed of characters: the ethical scientist. Perhaps we need legislation to preserve the species. A mathematical physicist, Clifford succeeds in devising experimental proofs of an alleged Unified Field Theory (formulated back in the 1990s by a man named Maesanger), despite obfuscation and finally outright obstructionism by his government employers. They want Clifford to stop farting around and do them something *practical*: a new bomb, maybe, or a nice death-ray. So they threaten to revoke the lease on Clifford's ivory tower.

He reacts strongly. He figures out a way to continue his work, and brings it to such a stunning conclusion that his

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discoveries make Einstein look like a mildly revisionist thinker. With the help of good friends and family, Clifford kicks modern physics back to square one, proves it to be only a minor, strictly local subset of *K-physics*. The implications are profound: before long Clifford is building black hole machines, playing games with gravity and supergravity, drawing free power from a continuum whose existence was unsuspected a decade before—and that, believe it or not, ain't the half of it. I don't want to give away two endings in one column, so just take my word for it that Clifford (like Sturgeon's "Mensch" and P.J. Plauger's "Wet Blanket,") is responsible enough to care how his discoveries are used, ingenious enough to devise what seems to me a foolproof and workable plan to prevent their misuse, and tough enough to see it through.

I mean, this hero is . . . well, a *hero*.

The speculative science is so completely worked out—and so mind boggling in its implications—that I'm too ignorant to follow more than every third paragraph. I might, in fact, have rejected it as just too Von Danikenly slick (it explains *everything*, and makes almost *anything* simple)—if it had not been for the imprimatur of Dr. Isaac Asimov prominently displayed on the back cover. Even so, there's just too much theoretical physics for the average reader—but I don't think there's too much for the average Analog reader.

Hogan's characterization and storytelling skills are frankly not as brilliant as his speculative science. But they are quite competent and entirely adequate, a good cut above average, given the dismal average these days. I like his characters.

I guess I've just read one too many of stories where the scientist is a neurotic genius more concerned with his grant renewal than with the applications of his clean little theories. If there *is* going to be a Brad Clifford, he must be in high school physics class about now, and mighty confused. Here's a positive role model for a change.

Writers think they got it tough.

Dancers, musicians, actors, singers, they all think they got it tough. Name a branch of the arts: its professional adherents will unanimously tell you that *they* got it the toughest, that *their* genre is the most despised of the gods. My wife Jeanne and I having been, between us, all of the above at one time or another, are in a position to testify that each group is correct. (I sometimes suspect that artists—like scientists and farmers and policemen—are despised by the vast majority who are not permitted to do anything useful, because they perform *necessary* services.) That notwithstanding, and bearing in mind that it is a trade neither Jeanne nor I ever worked, I believe I'm prepared to say that illustrators—SF and fantasy illustrators in particular—have Got It The Toughest.

Especially the ones who like to do visual storytelling.

Where can they work? Book and magazine art directors are looking for a one-shot, "sum up the whole story in one glorious image with an alien in it" illustration. Comic books will let them illustrate stories—but industry

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constraints require that the stories be moronic (one comic book writer admitted to me that he lived with "the nagging, dreadful fear that I'm making it too good."). Ditto for comic strips, only worse: imagine telling a story three paragraphs a day. The underground comics scene actually attracted three or four artists worth the trees they felled—and paid them off mostly in three-bean soup and free copies.

Now, of course, there's *Heavy Metal*, which I understand pays reasonably well. They use maybe ten artists a month, apparently always the same ten, and they seem to make a determined effort to find artists who like to *not* tell a story. And a few who don't know how.

Efforts have been made in recent years to create new forms in which the illustrative storyteller could function at more than anecdotal length: Gil Kane's *Blackmark*, Fabian & Preiss's *Starfawn*, Corben's incomparable *Bloodstar* and *Den* come immediately to mind. All were very interesting—and badly flawed. In each case the problem was story. In some cases the artist wrote his own story, which quite naturally was mediocre (I'd hate to have to illustrate my own stories). In other cases, they chose *others'* mediocre stories to illustrate—the exception being *Bloodstar*, which seems to have been by Robert Howard with a John Jakes rewrite, and which is fair-to-good if you like heroic fantasy.

At last, Byron Preiss made the obvious connection.

Gray Morrow is an artist with an

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impressive track record. He has appeared in magazines like *Galaxy, Nat-Lamp, Heavy Metal* and *Esquire*; painted one hundred Perry Rhodan covers for Ace (and, for contrast, the cover of Del Rey's recent edition of Cordwainer Smith's *Norstrilia*); illustrated the comic strips *Flash Gordon, Mandrake*, and *Prince Valiant*; and drawn more comic books than I've *read*.

So Preiss, creater of the *Weird Heroes* series, selected Morrow to illustrate a whole book full of science fiction novellas—and what stories did he pick?

"The Doors of His Face, The Lamps of His Mouth," "The Furies," a new Shadowjack yarn, and "A Rose for Ecclesiastes!"

All of course by Roger Zelazny, and for my money Morrow did a terrific job. Curiously, editor Preiss chose to open **The Illustrated Roger Zelazany** with the Shadowjack piece, not only the weakest of the four but the closest in layout and style to conventional comic book work. Still, it's several cuts above anything I've ever seen in a comic book as fiction, and a notch above average as comic art. But from there, Morrow's art improves sharply, the stories improve sharply, and more daring innovations in layout are successfully experimented with.

To my mind the least succesful is "The Doors of His Pants" (or whatever it is), where vertical or horizontal rectangles of type are laid out adjacent to blocks of pictures which, taken together, illustrate that block of type, making each page a sort of photo album with margin commentary. The one I liked by far the best was "The Furies," in which the text is laid out in four-column, with a small but quite vivid and detailed illo following about every third paragraph (the preliminary drawings and pencil art for this story were done by a Michael Goldin, who deserves more exposure). But all three are excellent, good science fiction, capably and lovingly illustrated. Morrow is not a great artist—he seems, for instance, unable to draw a convincing female chest—but he has a genius for communicating the heart and soul of a story in wordless images, and so enobles even these noble stories.

Be warned: editor/adaptor Preiss has taken serious liberties with text. Be reassured: Roger Zelazny authorized and approved and is happy with the changes, and me too. Preiss obviously sweated blood collaborating with Morrow on making story and pix fit together on the page, and deserves sustained applause.

I should add that there are about three pages of "filler"—five double-truck (2-page-spread) "murals" which amount to pastiches of imagery from various Zelazny novels and stories; a worthless two-page short story that looks like a Wally Wood parody; and some commentary by Zelazny, Preiss, and Morrow.

I definitely like it $8.95 worth. And I hope it sells well enough to encourage the publisher to continue this exciting new format with other artists and writers of equal calibre. I understand that a forthcoming *Illustrated Sturgeon* by Alex Nino is being previewed in *Heavy Metal*. How about, say, an Ellison/Corben? Or a Heinlein/John Buscema? Or a Philip Dick/Salvador Dali?

If you can't find this one in your

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bookstore, order from Baronet Publishing Co., 509 Madison Ave., New York, N.Y.

All right, that last one was kind of a fringe item. Let's get back to the hard-core stuff, good ol' science fiction books. Like the new one from Steve Allen.

That's right, the Renaissance Man of the twentieth century has finally done everything (well, everything legal, for sure)—he has written and published a book of science fiction. A novel, however, it is not—which seems to make Mr. Allen one of them New Wave types. Would you believe me if I told you that his book has no story whatsoever, consists entirely of dialogue between strangers who are never described and never leave their seats, and held me absolutely spellbound for hours at a time?

What it is, as half of you have guessed already, is a collection of six of the best scripts Allen wrote for his excellent and praiseworthy PBS series, "Meetings of Minds." For those of you who (shame on you) are not familiar with the show, what Allen does is host a kind of Susskind-format talk show such as Phil Farmer might have put into his Riverworld Cycle: all the guests are famous historical figures, selected for diversity and resurrected for an evening, four at a time. Specimen gathering: Charles Darwin, Galileo Galilei, Attila the Hun, and Emily Dickinson (she and Atilla bicker incessantly). Or how about Ulysses S. Grant, Marie Antoinette, Thomas More, and Karl Marx?

This is one of the most fascinating blends of education and entertainment I've ever seen, as effective on the page as it is on the screen (where the nation's TV critics voted it Best TV Writing of 76-77, in a tie with James Costigan's splendid "Eleanor and Franklin"). For that alone it might be profitably studied by novice SF writers. The whole thing is just flawlessly done, and it debunks damn near every common misconception of history I know about and a whole bunch I didn't. (Galileo claims he can't rightly remember whether he muttered "E pur si muove" or not.) And as near as I can see, Allen refused the temptation to grind a single ax: the treatment of Marx, for instance, strikes me as balanced and fair.

The book contains a peachy introduction by Allen, which describes the difficulties he encountered in producing for television a show that did things like present a balanced and fair presentation of Karl Marx (thank God for PBS!) and it is illustrated with stills from the series. The casting and makeup jobs are fabulous, and the picture of a particularly gross Attila sneering at a pugnacious Emily Dickinson is worth the price of the book. About which, by the way, I would like to say that any publisher forthright enough to charge me, not $9.95, or $9.99, but *ten dollars even*, is one whose catalogue I should very much like to inspect. When I find out that they call themselves Hubris House, my curiosity becomes acute.

You can order this one from Crown Publishers at One Park Avenue, New York, NY 10016—or do what I did: become a supporting member of your local PBS channel, and get this book as your membership gift. That way you're also helping to support the incredibly good *Nova* series. ■

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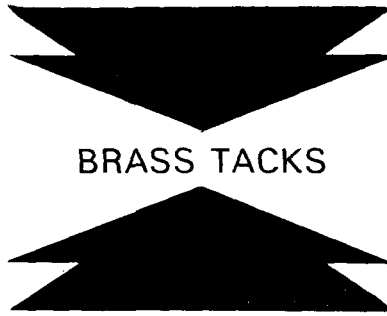

Dear Sir:

I feel duty bound to admit that although I first started reading science fiction at the age of 10 (25 years ago), my introduction to, and enjoyment of, firearms began at the age of 8. I still target shoot, find the history and collecting of guns interesting, and occasionally hunt game. And, horror of horrors, I even belong to the NRA.

Therefore, in many minds my status as a rabid gun nut is well assured. There is a great deal to be said about that, and about the entire problem of firearms and their myth and mystique in American society in general; and undoubtedly in such a discussion reasonable, well-intentioned, and honest men would find themselves disagreeing with each other. But it is not my intent to address that complicated and controversial subject here.

Nor do I have the slightest desire or intention to object to the right of others to abhor firearms, and to express their view clearly and publicly. And if the form of that expression happens to be a science fiction story, in the classic "If this goes on. . . ." format, which story appears in the magazine I've been reading for 25 years, that's fine too. I find no difficulty in reading and enjoying such a story, to the extent that it is well written and amusing.

But I feel constrained to point out that an important section of "To Keep And Bear Arms," by Jeff Matthews, is neither well written nor amusing. I refer to the section concerning Kenyon Ballew.

The entire episode in which Mr. Ballew and the ATF agents were involved is both clearly tragic and clearly questionable in regard to the actions of our government and its agents. At the very least, the ATF men were ill-informed, hasty, and somewhat overenthusiastic in their actions. And as a result, Mr. Ballew is now permanently and almost totally paralyzed.

He was certainly not the professional gun-runner they sought, as is evidenced by both the lack of any incriminating evidence at his apartment, and his unfortunate, unthinking grab for a nearby black powder pistol when he heard his door break in. Professional gun-runners and criminals gave up using black powder weapons back in the late 19th century. This was due to the simple fact that obviously superior stuff was available, and even the hard-pressed Indians were insisting on getting it from their suppliers. (They did in Custer and his men with lever action carbines.)

In any case, poking fun at a man, still living, who has been permanently paralyzed is in very poor taste indeed. Such inconsideration and cruelty is scarcely good writing, and is abso-

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lutely not amusing.

Mr. Matthews may disagree with myself or anyone else as much as he desires concerning gun control, and I will fight to the death for his right to his view, and for the right of any publication to print his stories and articles which embody that view.

But I will also fight for the right of Kenyon Ballew to not be ridiculed as he struggles through the long, hard days of a paralytic. Very likely no one consciously intended to add to Mr. Ballew's pain. But the power of pen and press directly implies a heavy responsibility for their use; and that responsibility falls directly on the writer and editor. And therefore, in my humble opinion both Mr. Matthews and you owe Mr. Ballew a profound apology.

R.J. DELVECCHIO
816 Long Hill Rd.
Middletown CT 06457

Lots of ideas and institutions were being ridiculed in Matthews's "To Keep and Bear Arms," but Mr. Ballew was not. As in all good satire, there is a biting edge of real pain in the story. And the proof of that is in the impact the story has had on our readers.

Gentlemen:

Once upon a time Astounding ran a story about weapon makers. I cannot recall the title, "The Weapon Shops of Isher?" "The Weapon Makers?" However, I do recall the motto of the story, "The Right to Own Weapons Is the Right To Be Free."

Mr. Matthews's story or sermon would have carried more punch if he had resisted the temptation for hyperbole. As it is it might serve as a comic relief during some future blackout or riot when, the politicians ordering the police not to interfere, small businessmen, shop owners and home owners, watch helplessly as their life's work is burned down and looted or their families raped and murdered by the beneficiaries of disarming the law abiding.

THOMAS J. MULLEN JR.
Mullencrest, Oldwick Road
Whitehouse Station NJ 08889

Let's face it, those fantasies of protecting the wimminfolk with your trusty shootin' iron belong in John Wayne movies. The unkind fact is that most of those shootin' irons are used by family members on each other!

Dear Mr. Bova,

I must assume that the opinion offered by Mr. Matthews on pages 152-162 of the March 1978 Analog is shared by the editor, publisher, et al. I am horribly disappointed that you have stooped to publish such trash; that you select such an underhanded way to purvey those ideas; that you permit these insults and lies to be printed in your magazine under the oh-so-thin-guise of "fiction." I used to think you people were intelligent. I used to think that you were capable of making distinctions about short stories relative to their literary value, interest, etc. To slander the NRA and our Congress by implying in this so-called fiction that votes in favor of basic rights of free people must be bought (see column 2 page 157 lines 18-25) is absolutely disgusting.

Up to now I had enjoyed Analog, believing it to be presented on a higher intellectual level than many SF publications before it. I especially enjoyed

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BIOLOG

by Jay Kay Klein

Unlike most writers, artists tend to settle down at an early age to their ultimate life's work. Richard M. Powers sold his first artwork at age sixteen, and has never had any other occupation. His liking for art and his facility at it give him reason to state that doing artwork beats working for a living.

A highly literate person in the classical tradition—he was a Latin and Greek major at Loyola University—Richard has a prime aversion toward items of low culture such as rock music and poseurs claiming affinity with dimly understood cultural items. Since he reads stories he illustrates, he prefers writers whose styles meet his own discriminating taste. Nor will he rush a painting, insisting on taking as much time as necessary to produce a work that pleases him.

Long a favorite of science fiction readers for his surrealistic paperback covers from the time he sold his first science fiction art in 1950, Richard had his first Analog cover only with the May, 1978 issue. He has had one man exhibitions at world science fiction conventions in 1962, 1971, and 1973.

He is also a "fine artist," noted for abstract expressionism executed in acrylics. These may be seen at the Rehn Gallery in New York City. In addition, he is a printmaker in association with Fine Arts 260. To all his work, he brings a background gained over many years of art study, first at the University of Illinois, then at the Art Institute of Chicago, the New School in New York with Julian Levy, and privately with Jay Connaway.

With Richard, one is never quite sure whether he's serious or gently poking fun at some situation, event, or person. I can only pass on Richard's comment that once when in the same room at a science fiction convention with Isaac Asimov and Johnny Weissmuller, he felt present at possibly the zenith of Western Civilization thus far.

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the science fact articles. I actually thought that by subscribing to Analog I could count myself among a group of intelligent people. Now I'm ashamed and embarrassed to be counted here. If this is what "intelligence" and "intellectual" mean, count me out. I've subscribed for a good many years, but I won't be renewing. I will, however, consider renewing if you (before my subscription lapses) print a story that presents the other side of the gun issue as strongly as this one did.

It's your move, Mr. Bova!

BARBARA H. GRANIK, WINRA
48 Tiller Lane
Bricktown NJ 08723

When we receive a story that makes as clever—and funny—a case for the pro-gun side we'll print it. But it's always easier to satirize the entrenched, pompous, self-righteous Establishment than to poke fun at the Loyal Opposition.

Dear Ben,

I was quite pleased to note two items of interest in your March issue which have prompted me to write for the first time in the five or so years that I have held a subscription. First, did I not detect a vague hint of pro-gun controllism in "To Keep and Bear Arms" by Jeff Matthews? Though I personally have not made up my mind on the issue, I have noticed a decidedly pro-NRA, promilitary, proviolence slant in many of your stories in the past. Without commenting on either the issue of gun control or the literary value of the story itself, I was quite pleased to read a story presenting the other view.

Second, it was with some interest that I observed the fanfare preceding, during, and after your recent women's issue. It was with even greater interest that I noticed stories by women receiving more than twice the space received by men in your March issue, without any fanfare at all. Am I witnessing a quiet revolution in the science fiction field? If so, it is a pleasant revolution which, considering the content of Ms. McIntyre's and Ms. Vinge's stories, I hope will continue. It seems, not to my surprise, that women are quite able to compete with men without any special considerations given to them by well meaning editors. I look forward to reading more enlightening and entertaining fiction by them in the future.

As for the stories themselves, George Olney's "Moontrack" was delightfully readable, but I found myself wishing I could know more about the alien Yedza's than was contained in the meager two columns devoted to them. Since it was obviously Olney's intent to concentrate more on the human element and on the lunar infantry adaptations involved, I suppose this can be excused. Perhaps in the future . . .? Vonda McIntyre's story was easily the best in the issue (reserving comment on Joan Vinge's until its conclusion in April). The character of Snake, molding a fiercely independent and determined yet compassionate and responsible woman into one, was infinitely believable. More!

JEFFREY A. COCHRANE
P.O. Box 642
Providence RI 02912

P.S. Who is responsible for that excellent illustration on page 86? It caught my eye and held it, something a good illustration should do.

NRA members regard Analog as an

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antigun magazine, while other readers believe we are progun. Good! As a forum for ideas, Analog is neither . . . yet both. The Special Women's Issue (June 1977) was intended to attract new women readers, and apparently it worked to a great degree. Janet Aulisio, one of the few women illustrating *science fiction stories, created the drawings for "The Broken Dome."*

Dear Mr. Bova:

I regret never having written to tell you how much I've enjoyed Analog in the 10+ years I've been a subscriber. Now, however, I am forced to write to express my dissatisfaction with a story in your March issue . . . "To Keep and Bear Arms," by (Jeff) Matthews.

It seems to me that gun control should be . . . a subject for serious discussion, which . . . is not served by Mr. Matthews's diatribe. In my judgment this piece is inferior fiction because the author does not show the least sympathy or understanding for the people he is writing about. In fact, I can't think of any group of more than a million people that deserves the treatment Mr. Matthews gives the NRA.

I must also confess that I miss the point of the description of the unfortunate experience of K. F. Ballew. Matthews describes how Ballew was shot down in his living room by Treasury agents, and then apparently finds Ballew the guilty party because he owned a lot of guns. I am astonished to find this sort of illogic in a magazine of Analog's quality (forgive me, I almost said "caliber.")

The violent differences of opinion on questions like this should lead to more insightful work than the one-sided attitude of this story. For example, the popularity of conspiracy theories among some of the far right (and left) appears to me not as a case of idiocy rampant, but as a desperate attempt to answer an unanswerable question: "How can these people hold so strongly an opinion which, try as I might, makes not the least sense to me?"

Also, I'm not demanding that you recant, or try . . . to stifle anyone's freedom of expression. The article in question does appear to be more of an editorial than light fiction, and as such, an article expressing the opposite point of view might be desirable for balance.

In any event, let me repeat how much I have enjoyed, and do enjoy, reading Analog. If, however, the views expressed in "To Keep and Bear Arms" are to be regular editorial policy, I will, sadly, cancel my subscription.

WILLIAM BELL
8464 Oakwood Street
Westminster CO 80030

Many progun readers were upset by "To Keep and Bear Arms," a sure sign that the story was strong enough to jab a tender nerve. And many readers have both demanded a more "reasonable" editorial attitude and threatened to cancel their subscriptions, in virtually the same breath. The anguished roars of gored oxen are ringing throughout the land!

The point of the Ballew incident, of course, was that a private citizen can get gunned down by Authority or Criminals regardless of his private arsenal. Possessing guns does not make you bulletproof!

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Analog is a forum of ideas, and we will gladly print any story that entertains our readers, regardless of its philosophical slant. Of course, if the story is strong enough to upset many of our readers, so much the better. Pain makes you think. Thought makes you wise. At least, in theory.

Dear Sir:

Greetings also to author/writer Leonard Lockhard address unknown. Many tales have been told of the Patent Office using this or that fictional text as a bar for novelty in a real patent application. This letter is for the purpose to testify that the Finnish Patent Office found the story "The Professional Touch" by Leonard Lockhard, Astounding Science Fiction, February 1959 as a complete anticipation for a patent application, what is more concerning a device now in production.

To clarify for those, who have their 1959 file of ASF handy, the application was not for 2, 3, 6, 7-(a, b, a', b' diphenyl-e, e'-bis [2-methyl-amino-4-cloro-1, 3, 5-triazyl-6-amino] -c, c'-disulfonic acid) oxapene-4 which according to the story was an ionizing agent, but for the use of a second contra-charged vase (or receptable, as patent men say) to collect the dust what the primary ionizer charged with the primary charge.

Anybody reading the story will find the author suggested this in the story. Too bad if he didn't file a patent application for that idea. As said earlier, such a device is now in production in Finland.

That's the way the ball bounces.

JUHANI RAINESALB
Chief of electrical division,
Finnish Patent Office
Helsinki Finland

It's not the first patentable idea to be published originally in this magazine. Nor will it be the last.

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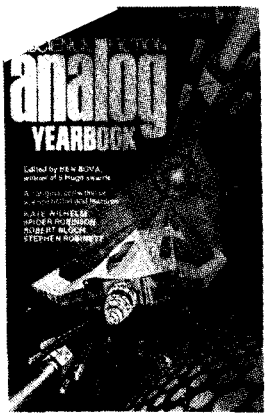

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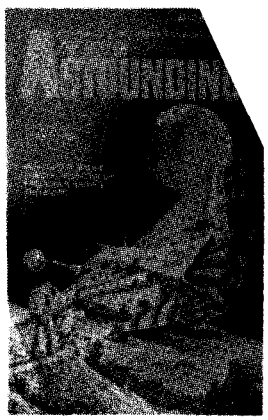

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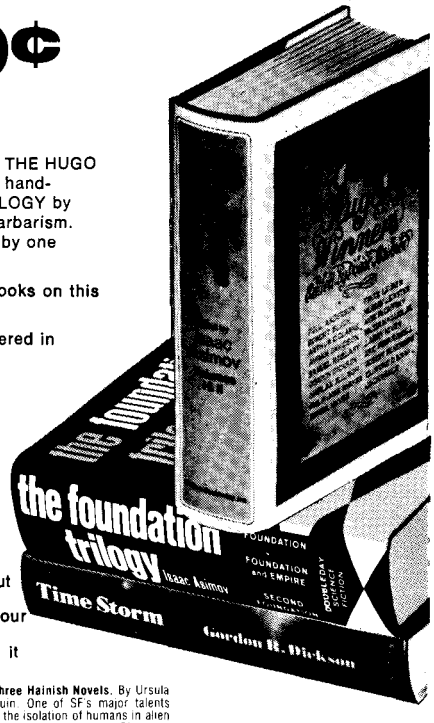

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